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## RESOURCE UTILIZATION, SUPPLY

### ACADEMICS, OFFICIALS CONCLUDE CONSERVATION STRATEGY DEBATE

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["Editors' Round Table Discussion", with Astakhov, A. S., department head of the Academy of the National Economy under the USSR Council of Ministers; Oldak, P. G., department chief of Novosibirsk University; Markov, V. A., subdivision chief of the USSR Gosplan; Danilov-Danilyan, V. I., laboratory chief of the Academy of the National Economy under the USSR Council of Ministers; Mikhaylov, N. A., department chief of the All-Union Scientific Research Institute of Standardization of Gosstandart; Knizhnikov, V. A., department chief of the Institute of Biophysics, USSR Ministry of Health; Sukhotin, U. V., senior scientific associate, Central Economics and Mathematics Institute; Mizernitskiy, L. A., deputy chief of the technical administration of the USSR Ministry of Ferrous Metallurgy; Vitt, M. B., sector chief of the Scientific Research Institute of Prices, USSR State Committee for Prices; Lukyanchikov, N. N., laboratory chief of the Central Scientific Research Institute of Ferrous Metallurgy; Pakhomov, V. P., sector chief of the Institute of Economics, Ural Scientific Center, USSR Academy of Sciences; Grigoryeva, S. V., junior scientific associate, Central Economics and Mathematics Institute; Golub, A. A., junior scientific associate, All-Union Science Research Institute of System Research, USSR Gosplan and USSR Academy of Sciences; Chernegov, Yu. A., section chief of the Council for the Study of Productive Forces, USSR Gosplan; Rozovskiy, B. G., deputy chief, Voroshilovgrad Branch of the Institute of Economics of Industry, UkrSSR Academy of Sciences; Bykhovskiy, A. V., senior scientific associate, All-Union Scientific Research Institute of Medical and Medico-Technical Information, USSR Ministry of Health; Gold, G. S., chief, sector for economics and information, Central Scientific Research Institute of Nonferrous Metallurgy; Podolskiy, Ye. M., senior scientific associate, Council for the Study of Productive Forces, USSR Gosplan; Fedorenko, N. P., Academician: "Problems of Increasing the Economic Efficiency of the Utilization of Nature"]

[Text] Restructuring the System of Evaluation Indicators

Astakhov, A. S., department head of the Academy of the National Economy under the USSR Council of Ministers, doctor of economic sciences

The basic questions of the effectiveness of the utilization of nature arise in connection with the fact that a considerable proportion of economic decisions, while producing a positive production effect, at the same time have a negative influence on the natural environment. Therefore a rationally balanced solution can be found only within the framework of improving the unified economic mechanism.

The requirement of a national economic approach to evaluating any measures, even private ones, is recognized as fundamental for calculating the effectiveness of production decisions at the present time. Nonetheless the real management practice of the branches and enterprises is still based on much more narrowly interpreted, purely local "cost accounting" [khozraschet] indicators of the enterprise itself--like profit.

Herein lies the source of many undesirable consequences, particularly in the area of the utilization of nature. Yet there exists the even widespread opinion that the criteria for national economic effectiveness are intended only for tasks of the upper levels of management, and cost accounting--for the lower ones. This is undoubtedly wrong. The solutions to any problems--large or small, of the Gosplan or the enterprise--should be equally directed toward obtaining a maximum national economic effect. And if the existing system of evaluation indicators poorly reflects various aspects of this concept it should be restructured, and the principle of restructuring here is not "to each his own," but "all toward the achievement of a unified, common goal." One of the most important points of cost accounting is the combination of the interests of the society and those of individual collectives of workers; if they do not coincide the economic apparatus should be rearranged in such a way as to interest the collectives of the enterprises in achieving that which is advantageous for the national economy and not the opposite.

The emphasis of this principle becomes especially important under the conditions of the restructuring that is being carried out today where the right to make decisions is being shifted to a considerable degree to the "lower levels" of management--the enterprises and associations. The existing cost accounting indicators of the enterprise (profit and so forth) actually do not encompass many specifically important components of the national economic effect that are generated by the activity of the enterprise. In particular, the following important components of the overall national economic effect ensuing from the influence of production on the environment remain imprecise:

expenditures on compensation for lost natural resources (often done by enterprises in other regions under more difficult conditions of reproduction);

related expenditures and results that are manifested in associated branches;

expenditures and results generated by "today's" decision, in the future;



losses of accompanying components of natural resources that are not taken into account for the given enterprise as a mandatory product ("side" components of a number of narrow-profile mining enterprises and so forth);

losses of the national economy--as a result of the implementation of capital-intensive decisions (the indicator of reduced expenditures is replaced by production cost in the actual practice of the enterprises);

social consequences related to prospects of exhausting the best limited natural resources.

The specific amounts of the aforementioned components of the national economic effect differ for various types of production decisions. Frequently they greatly exceed the local effect that is being dealt with and sometimes they even make it negative. It is especially necessary to take these components into account when speaking about large structural changes in production, and it is precisely toward these that our major efforts should be directed during the forthcoming period. Structural effects are of primary significance for the branches that exploit nature: "Task No 1" for them is always an effective selection of the proportions of the natural resource that is objectively distinguished by the most advantageous conditions for exploitation. But it is precisely the effect from the change in the structure that cannot be evaluated or taken into account by local indicators of an individual enterprise.

In order to realize in practice the principle of the national economic approach to production (in particular, environmental protection) activity, it would be expedient to include among cost-accounting indicators the indicator of the national economic effect that encompasses the aforementioned components as much as possible. This indicator should be reflected in planning and reporting documentation and the existing system of incentives for workers of the enterprise should be linked to it. It would seem that the introduction of one additional, really "final" indicator would help, finally, to be rid of our currently typical practice of accounting for a multitude of intermediate indicators that actually do not give the necessary information for making substantiated management decisions.

Can this indicator be calculated? If one keeps in mind the mass nature of these calculations)? It can be, but it is necessary to approach its definition without losing common practical sense and without overcomplicating the task with theoretical fine points.

Science long ago substantiated specific measures for calculating the majority of the aforementioned components of the national economic effect. The corresponding methods have been tested, approved and are used everywhere in the practice of planning (discounting expenditures made at various times, accounting for expenditures of associations, the formula of added expenditures and so forth). But when constructing the new capacities using these criteria and evaluations we have so far been limited to the area of their current application: they are still missing in cost accounting for enterprises that are in operation. Why? It is difficult to answer this question from the standpoint of national economic logic.

I think that the slogan of the national economic approach to the utilization of nature will be properly embodied in practical deeds only when the appropriately regulatory economic indicator is reflected in the existing system of accounting and accountability, analysis, planning and material incentives at all levels of the management ladder. Calculation of individual components of the national economic effect should thus be regulated as simply as possible and the components of the expenditures by the associates could be reflected through coordination with them in a matrix form.

From the Economic Effectiveness of the Utilization of Nature to an Evaluation of the Results of the Development of the Metasocial System

Oldak, P. G., department chief of Novosibirsk University, doctor of economic sciences

The connection between production and nature is bilateral. Nature acts as a production resource and from this standpoint one can speak of the effectiveness of the utilization of nature. Production affects nature and thus determines, on the one hand, the productivity of the natural complexes (and, consequently, also future possibilities of the development of production itself) and, on the other hand, the quality of the environment for habitation and, consequently, progress or regression in solving problems of improving the national well-being. The latter dependency leads us to the idea of the correctness of singling out the highest system of connections of the social structure--a metasocial system that includes three subsystems (economic, social and ecological).

With respect to the metasytem, the results of economic activity are an intermediate level. The highest goal is to maintain the stability and productivity of the metasytem. An increase in output is no longer compared only with expenditures on its production, but also with the change in the condition of the natural systems and future possibilities and also the health and qualitative changes of the environment.

Accounting for social wealth (vector: increase in flow of goods and services, increase in knowledge, dynamics of potential of natural systems, dynamics of quality of life) is of a primary, higher order; accounting for effectiveness is secondary. It can be a reference point only within the limits of the given boundaries of protection of natural systems.

Economists should learn to think in the category of the metasytem and define and establish strict limits on the permissible load on natural complexes, and on the broader plane--changeover to solving problems of control of the development not of public production, but of metasocial systems. It is necessary to think about how to raise economic science to this high level of research.

## A Comprehensive Ecological-Economic Evaluation of Construction Projects is Needed

Markov, V. A., subdivision chief of USSR Gosplan

The selection of almost every decision concerning the creation of a large production facility and its location and new technical equipment should take into account the complexity and changeability of interrelations in the ecological system where intervention can lead to the most unexpected consequences. Intensification of public production through extensive development of efficient utilization of natural resources exerts a decisive influence on the reduction of the level of pollution of the environment and therefore the need to construct purification installations should be considered in cases when there are no technical decisions concerning the creation of waste-free production processes or they are economically disadvantageous in the given stage.

In keeping with the instructions concerning the composition and policy for development, coordination and approval of planning estimate documentation for the construction of enterprises, buildings and structures,<sup>1</sup> the working plan for new construction or expansion and reconstruction of existing enterprises includes the section entitled "Protection of the Environment." It should give data concerning the quantity of harmful substances that are formed, proposed measures for reducing the formation of wastes in the process of production and through the construction of water and gas purification structures and installations, the balance of water consumption and water allotment of the enterprise, and the restoration (recultivation) of land disturbed during construction and other environmental protection measures.

Taking into account the fact that capital investments are used for implementing these measures, it is necessary to account for their economic effectiveness.

Each year the country develops an immense number of plans for the construction of new enterprises and the expansion and technical reequipment of existing ones as well as new kinds of technologies and designs of equipment and machines. All of them are considered by various departmental and state commissions and branch expert commissions, and the most important are considered by expert commissions of the State Committee for Science and Technology, the USSR Gosstroy and the USSR Gosplan. There are frequent cases in which as a result of the expert evaluation it is noted that the environmental protection measures earmarked in the plans are poorly substantiated. An essential shortcoming is the lack of a comprehensive evaluation of the effect of the basic production processes on the environment. As a rule, the measures being considered for preventing the discharge of polluted wastewaters are directed toward the construction of water purification installations (at best--the creation of recycled water supply systems) and installations for purifying gases of harmful substances that are discharged from stationary sources of pollution.

Questions of efficient utilization of natural resources and raw materials and salvaging of wastes formed at the planned facility or at other enterprises located nearby are not considered.

The technological processes and technical means applied in branches of the national economy become more complicated and larger in scale each year, and this, in turn, gives rise to difficulties in determining the negative consequences from the introduction of technical achievements. But the possibilities of correctly evaluating these consequences are constantly expanding as well.

The ability to take advantage of the experience in such evaluation that has been accumulated in our country and in others, an analysis of alternative decisions and extensive application of economic calculations of expected advantages and losses, taking into account protection of the surrounding environment, make it possible to avoid the basic negative effects and reduce the probability of unexpected situations to a minimum.

A great deal here depends on the correctness of the selection of criteria for evaluating the influence of the measures earmarked in the plan on the environment and methods of conducting this evaluation. But up until the present time, there are no methodological recommendations or requirements for criteria, and they must be developed.

#### Developing Content Control of Processes of the Utilization of Nature and Analyzing Their Long-Term Consequences

Danilov-Danilyan, V. I., laboratory chief of the Academy of the National Economy under the USSR Council of Ministers, doctor of economic sciences

Much has been said here about the fact that the quality of resources that are being utilized is deteriorating, the concentration of useful components is decreasing, the content of impurities is increasing, and expenditures on environmental protection are growing. Does it follow from this that labor productivity in the branches that utilize nature and in the national economy as a whole should decline and the results of public production decrease? No, we also know about opposing factors, the main one being scientific and technical progress, which makes it possible: to process natural raw material comprehensively utilizing all of its components; to improve the technology of extraction, and so forth.

Scientific and technical progress and its role in the utilization of nature are a strategic issue. Frequently it is precisely long-term strategic problems that are hidden by other problems: whether or not to introduce payment for the utilization of natural resources? To apply closing expenditures or not? We calculate the indicators of the medium- and short-term effectiveness, but here we do not recall that the approach to selecting measures taking into account the long-term aspect should be altogether different.

Examples have been given of how unintelligent utilization of natural resources after a certain amount of time entails negative local or general economic consequences. In the majority of cases this is related to the fact that the solutions to the corresponding problems have not been technically prepared. When decisions are made in the sphere of the utilization of nature it is necessary to anticipate the consequences to which their implementation will lead in other spheres of the economy.

The selection of decisions that are clearly inexpedient from national economic positions is most frequently directed by departmental interests and numerous methods for evaluating the economic effectiveness of all possible measures can be "confirmed" by a calculation of the "expedience" of whatever one wishes. The main shortcoming of such methods and plans for improving and unifying them is the idea of infallibility that permeates them, of some kind of precise result, even though the initial data of the calculations are necessarily extremely approximate if not completely arbitrary. Academician T. S. Khachaturov gave here a very convincing example of a formula recommended by one of these methodologies. Yes, we are forced to use "rubber yardsticks"--such is the specific nature of the objects and the task. But it would be the grossest deception to think that a rubber yardstick can be used in the same way as a metal one. What could be simpler: having evaluated the error of the initial data, using the Lagrange theorem concerning the final increments, one can determine the possible error of the result. At least it will be clear how much our rubber yardstick can stretch. But not a single method has recommended anything of the kind. I certainly do not wish to say that there is no need to calculate in such cases. One should simply recall what it is we are actually calculating.

But it is not only a matter of precision of data, but also the possibility in principle of quantitatively reflecting certain aspects of our activity, mainly in the sphere of the utilization of nature and scientific and technical progress, and then comparing them. How could it be possible using only a scalar indicator to give an "economic evaluation" of the supplies of an iron ore deposit if it is expected that it will be operated for no less than 50 years? When we suggest a formula to solve this false problem we are simply trying to exchange meaning for a number.

Let us take the problem of economic evaluation of the harm caused to the environment by production. When economists prepare for applying the corresponding methods they gather an extremely large amount of useful information. But this is where their work stops, the data are put into a formula, calculations are made and...the figure that is obtained has no clear economic meaning, it does not evoke confidence in the people who are making the decision (LPR) and they are doing well if anybody even recalls that the calculated "symbol" of harm was preceded by a mass of useful data that require interpretation, and it will be necessary to generalize them without resorting to unnecessary calculations (but, of course, resorting when necessary both to models and to computers). The aforementioned calculations are unnecessary because it is impossible to squeeze all aspects of the economic harm caused by anthropogenic influences into a single number. In and of itself this number expresses incomparably less than we know, and than we need in order to make a decision.



A good deal has been said here about closing expenditures and about the fact that they must be introduced into the practice of management. But are we convinced that a restructuring of price setting and planning in keeping with the principle of closing expenditures will in practice lead to the same results that we have become accustomed to seeing in the models? Under the conditions of the existing "pro-expenditure" economic mechanism closing expenditures will inevitably become a justification for higher costs. If the closing expenditures for some kind of raw material are, say, 25 rubles per ton and this amount is accepted for the permissible level of expenditures, why strive for having the real expenditures turn out to be less in any specific place? But one can show that even with the economic mechanism that is on the whole anti-expenditure, following the principle of closing expenditures can create a powerful stimulus for inflation.

A comparison of models of closing expenditures with reality shows that they cannot be declared to be a universal instrument that is suitable for all cases in life and their applicability must be especially substantiated each time.

The preceding considerations have pertained mainly to the role of closing expenditures when selecting planning decisions for the future. Two more possible areas for their utilization are also being considered: for economic evaluation of deposits and as a basis for determining prices for products of branches that exploit nature and evaluating natural resources, in keeping with which payments should be made for the utilization of nature. The first of these, in our opinion, is not of practical interest yet: one can see no specific applied problems whose solution could be aided by such evaluations. The second is related to the tendency toward expansion of the sphere of effect of commodity and monetary relations (TDO). But TDO's and the structures of the economic mechanism based on them function the better the less essential for the development and functioning of the economy remains beyond the limits of what is economized, that is, all that which has a fairly adequate economic evaluation. But the development of society takes place in such a way that the most essential problems lie beyond these limits, allowing "economization" only to a relatively insignificant degree--between them and the utilization of nature, scientific and technical progress, and social aspects. In order to solve such problems it is not enough simply to expand the sphere of effect of the TDO (sometimes this is even impossible). It is necessary first and foremost to control and regulate the content of the processes taking place outside the "economized" sphere.

For this and other reasons TDO's should be augmented by principally different, opposing components of the mechanism for socioeconomic control. They should not be borrowed but should correspond to the essence of our social structure. Developed methods of planning and accountability in our country are largely formulaic and this is why they are not sufficient as a counterbalance to TDO's. These should include above all democratic mass control of the content and not of the superficial characteristics of the processes that are taking place; in particular, and in the sphere of the utilization of nature, the development of public control is not only a necessary addition to the measures being discussed but is undoubtedly even more significant and crucial than the activization of TDO's itself.

In conclusion I should like to discuss the creation of a special department for the protection of nature and the utilization of nature. We have the Ministry of Ferrous Metallurgy, the Ministry of the Petroleum Industry, the Ministry of the Coal Industry, the Ministry of Water Management and the State Committees for Science and Technology. But are things really going so well with the extraction of petroleum and coal, the production of rolled metal and pipes, land reclamation and the introduction of the achievements of scientific and technical progress into the economy? It seems to me that we still have quite convincing justification for the need to organize such a department.

#### Improving Normative Support for the Utilization of Nature

Mikhaylov, N. A., department chief of the All-Union Scientific Research Institute of Standardization of the Gosstandart, candidate of geological-mineralogical sciences

Control over the observance and responsibility for a violation of legal acts are ineffective without the appropriate support for them with normative-technical documents and standards. Examples are the laws concerning the protection of the atmosphere, the animal kingdom, the fundamentals of legislation concerning water and minerals, and so forth. The inadequate effectiveness of these most important environmental protection documents, in addition to everything else, is brought about by the lack of standards and other normative-technical documents that regulate and organizationally reinforce in them mandatory requirements, rules and norms in the area of the protection of nature and efficient utilization of natural resources. Standards in various areas of the utilization of nature determine the requirements on the quality of one or another useful mineral (water, coal, petroleum, metal ores, natural construction materials, soil and so forth) and, as a rule, do not contain requirements concerning the protection of nature and efficient utilization of these resources.

Whether the reasons for the inadequate effectiveness of the development and improvement of standardization of activity for the protection of nature? The first is the lack of preparation of fundamental and branch science for regulating and reinforcing in standards concrete requirements and norms for efficient utilization of nature. Even the temporary methods or instructions that have been developed and are supposed to be in effect do not have the mandatory force of a normative document until they are introduced into a standard or approved in the form of another normative-technical document. And standards, as a rule, are subject to revision every 5 years, but changes can be made in them annually.

The second and very significant reason is the lack of interest on the part of ministries and departments that are active utilizers of nature in regulating or limiting their activity with standards. The failure to observe standards, as we know, leads to liability, the measure of which is determined by the amounts of harm caused to the surrounding natural environment. Because of this a number of fundamental norms for efficient utilization of nature should be approved and put into the standards by directive.

The development and substantiation of the necessary normatives that regulate efficient utilization of nature and also the preparation of drafts of standards on the basis of these should be made more active and should be carried out by academic and branch scientific research institutes, and the expert evaluation and approval of these should be done by the Gosstandart. We have positive experience and practice in this kind of organization of work and it must be expanded. Here is an unquestionable reserve for increasing the socioeconomic effectiveness of the utilization of nature.

PDK's [Maximum Permissible Concentrations] Should Guarantee the Necessary Safety and Be Economically Feasible

Knizhnikov, V. A., department chief of the Institute of Biophysics of the USSR Ministry of Health, doctor of medical sciences

I work with problems of hygienic norm setting, that is, those same PDK's that have been discussed here. I am interested not so much in the legal status of PDK's as in their essence and their substantiation, how they can be applied and how they should not be.

I shall begin by saying that for the hygienist the word "economics" is taboo because there is the principle of substantiating PDK's which says that there should be no accounting for economic and technical possibilities and attention should be paid only to medical information.

The PDK is the concentration of harmful substances which guarantees complete and absolute safety for human health. In essence, these are not maximum permissible concentrations but hygienically completely safe concentrations (GPBK).

When we are able to achieve and observe PDK's this is wonderful, but this requires the corresponding investments, many of which are simply unrealistic today. For example, it would take tens of billions of rubles in order to observe the PDK for sulphurous anhydride. Where will the money come from? The Food Program? Housing construction? Public health? Some branch of industry? Or, possibly, can we make a reasonable compromise and substantiate the real PDK and not the GPBK? This is why hygienists have had to deal with economic problems.

How does one substantiate a PDK so that it guarantees the necessary safety and is economically feasible but does not cause harm to the society? To do this, obviously, it is necessary to take advantage of the concept of weighed risk. This weighing of the advantage and harm for the multilateral interests of the society is impossible without economic analysis and the application of economic indicators.

Good health is one of the most important social goals, but others also exist. One cannot recall that the money invested in the observance of poorly substantiated PDK's can end up in severe consequences for the society, including for its health. But there is another, more frequently encountered,



situation, and a very alarming one, where it is possible to observe PDK's but this is not done.

Much has been said here about the fact that sometimes expenditures on the protection of nature do not produce the necessary effect or could produce a greater effect in other spheres. There is an analogous situation in hygiene and in medicine. In one case it costs 15,000 rubles to save the life of one person, for example, when there is kidney inadequacy or the use of an artificial kidney. In industry and energy engineers it costs from several thousand to several million rubles to prevent damage from harmful discharges. This is the purely economic side. But one must also take into account the social and subjective aspects of the society's attitude toward the risk to health from various factors. When distributing funds for the protection of the environment from various toxic agents it is necessary to take these subjective and social factors into account as well.

Under real conditions most frequently pollution takes place as a result of several agents simultaneously. What is done to evaluate the danger? Do they sum up one PDK with a half-PDK and two-tenths of a PDK of the third agent and it turns out that in terms of the effect this is already 1.7 PDK's of some substances. But this kind of addition is incorrect. We know that dependency between the dose of radiation and its effect. We know the dependency between the concentration of fluorine in the water and fluoros in teeth. But for the majority of other substances we do not know the quantitative dependencies between the number of the PDK and the actual harm to the health. Moreover, we still do not know and essentially have only begun to study the influence on the health of two or more agents simultaneously. Hygiene is still not able to establish a dependency between doses and damage.

In order to construct a rational system of economic control over protection of the environment it is necessary in the first place to know the dependency between the content of a given agent in it and the condition of the health of the population in one zone or another; in the second place, to be able to express the harm to the health in economic indicators. This will make it possible to direct money where each ruble will produce the greatest effect.

We have taken only the first steps in the direction of evaluating harm to the health in rubles (let this not sound like blasphemy, since we are speaking not about the price of health or life but about the permissible expenditures on avoiding one kind of damage or another and premature death). Here we need the assistance of economists. Then it will be possible to make the system of hygienic regulators of the quality of the environment more flexible and effective. It must include both GPBK's and PDK's. The observance of the PDK should be strictly mandatory, since when these are substantiated the multilateral interests of the society will be taken into account, including economic ones.

## What Should Be the Strategies for Making the Utilization of Nature More Efficient?

Sukhotin, U. V., senior scientific associate of the Central Economics and Mathematics Institute, doctor of economic sciences

In current discussions about the utilization of nature, in my opinion, there is a prevalence of simply fact-listing to the detriment of the necessary generalizations. Participants are taken up in a discussion of specific cases of inefficient utilization of nature and erroneous decisions in current management and capital construction. Therefore the proposed measures for correcting the aforementioned defects are usually of an individual nature and are directed against the consequences of the mistakes that have been made instead of toward overcoming the reasons for them. Yet the stereotypical character of the violations of the utilization of nature point out that they are conditioned by common factors. The latter are rooted in the imperfect socioeconomic relations and management mechanisms and therefore cannot be eliminated by any number of correct recommendations regarding questions of technical equipment, technology, agrobiological and so forth.

But to the extent that modern discussions pertain to questions of general principle, there is an underestimation of the key role of economic mechanisms of planned management and the crowding out or substitution of these with suggestions to improve the quality of economic calculations. With all the importance of this task it is still auxiliary with respect to improving socioeconomic relations which makes it possible to improve the very approach to the matter by all participants in the utilization of nature and to activate special knowledge and economic experience in public interests. The defects of the decision-making mechanism itself can hardly be compensated for by improving calculations. Not to mention the fact that far from all the results and consequences of these decisions can be expressed with a quantitative evaluation (and therefore "calculated substantiations" in principle cannot be complete) and shortcomings in socioeconomic relations turn out to be one of the impediments to practical utilization of improved methods of economic analysis or contribute to the "introduction" of oversimplified, unreliable versions of these methods.

Thus closing expenditures that are so popular today in modern applied developments essentially act as a measure of actual outlays and not socially necessary expenditures, which would correspond to their fundamental content. This property can be attributed only to closing expenditures that are formed during the course of optimizing the overall production program--the utilization of nature (it is not mandatory to think of it as the all-embracing "calculation of the national economic optimal plan"--in principle there is the possibility of replacing this procedure with the proper organization of economic interactions among participants in public production. But these conclusions have been obtained from very simplified, "stylized" economic models and are still far from direct practical application). As distinct from optimization, indicators that are formally similar to evaluations of the optimal plan (including closing expenditures) not only do not guarantee the best decisions, but can contribute to deterioration even of the initial

situation.<sup>2</sup> And it is not surprising that potentially powerful instruments for streamlining management require a high culture and are "double-edged." The observance of all conditions and rules for their application can lead not to an advantage, but to a large loss.

Hopes of immediately reaching the optimal, maximally economical public economy by copying or combining somebody's "experience" (whether foreign or historical) seem unrealistic. The task of improving existing relations and mechanisms in areas that make it possible not to allow "large-scale" manifestations of wastefulness seem more feasible. It is necessary to study more deeply the main socially conditioned sources of uneconomical operations so that in actions to correct the economic mechanism one can avoid both pointless "cosmetic measures" and blatant "abolition" of elements of management and business that might be necessary.

The most crucial manifestations of uneconomical utilization of nature are linked to the prevalence of departmental stereotypes of management. In addition to extravagance in current management they frequently take the form of advancement and "pushing through" of large-scale measures that are not well thought out (the plan for diverting northern rivers, industrial assimilation of the Baykal Zone, Sevan and so forth). Expenditures just to compensate for the harm they have caused frequently greatly exceed the positive results. Yet a large amount of energy is being manifested not only in publicizing these frequently "problematic results, but also in "ideological justification" of those primitive economic calculations which create the illusion of the advantageousness of the projects. We know of articles in the press by managers of departments who try to depict the lack of an economic evaluation of the and hydraulic resources as something that is supposed to be a fundamental conquest of socialism.

Neutralization of these desires requires a strengthening of the responsibility of the distributors of property to their subjects, which under the conditions of socialism means consistent democratization of management of the economy. This pertains both to recruiting and changing management personnel and especially to strengthening public control over their activity. References to the notion that the abundance of verifying officials and agencies will not produce the expected improvements today are unconvincing. We need a qualitative improvement of the control mechanisms--the insurance of independence from the influence of those who are being inspected and increased authority in defense of the interests of the society. It is especially important to have a great deal of openness in the situation, which in the sphere of the utilization of nature can be provided, for example, by establishing mandatory public expert evaluation of all plans that are of great national economic and ecological significance.

Integration of agencies for controlling branches that utilize nature (Gosagroprom, RAPO) will undoubtedly contribute to the fight against departmental separation, but to overcome it fundamentally involves further development and deepening of democratic centralism with the formation and the activity of these agencies. Another factor in overcoming the negative consequences of excessive administration--the development of the economic independence of production collectives--does not exhaust the problem of

improving the economic mechanism for the utilization of nature, for improvement of economic results of the operation of enterprises in and of itself does not guarantee proper maintenance, restoration and multiplication of natural resources and other elements of the environment as public property. Therefore proposals to create state agencies to perform these functions that are independent of the utilizers of nature seem correct. It would be correct to add to the latter the organizational offering of natural factors for economic exploitation (with the prerogative to take them away from negligent users) and also mutual rent payments.

#### Improving the Methodological Bases for Making the Utilization of Nature More Efficient

Mizernitskiy, L. A., deputy chief of the technical administration of the USSR Ministry of Ferrous Metallurgy

One could hardly find another branch of the mining industry that is experiencing more deeply the critical need for improvement of the methodological fundamentals of making the utilization of nature more efficient than ferrous metallurgy is.

Nature has arranged things in such a way that the ore resources are concentrated mainly in the European zone of the country and coking coal (70 percent), without which ferrous metallurgy cannot operate, is in the east. This has generated an immense transportation "pendulum" which determines the working conditions and the economy of the branch. Since ferrous metallurgy is a base branch, its position is also reflected in the condition of the entire national economy.

When drawing up long-range plans for the development of the mineral and raw material base of the branch it will be necessary to substantiate the sequence of the assimilation of deposits: which of the must be assimilated first and which can wait? Usually preference is given to large deposits. But in the eastern zone of the country the assimilation of even relatively small deposits, but by the group method, with a common factory for processing ore, makes it possible to successfully solve problem of forming a local raw material base for ferrous metallurgy. An example is the Kuznetsk Metallurgical Combine which operates on the basis of a number of relatively small deposits of Gornaya Shoriya and produces the least expensive metal in the country. At the same time up to this point the decisions frequently orient the development of metallurgical plans of Siberia mainly toward raw material from the European zone of the country.

In this respect the correct answer could be provided by methods of economic evaluation of mineral deposits that are based on closed expenditures, but their application in ferrous metallurgy has been unjustifiably delayed. The economic effect from their introduction in this branch alone would amount to billions of rubles. Therefore it is quite necessary to legalize this document and, on the basis of this, plan for the development of industry. This will make it possible to avoid the complications that have been discussed before.

Beginning in the 1970's when the fundamental documents concerning protection of the minerals, land and other natural resources were adopted, the country organized planning of their protection and efficient utilization. This had a certain positive effect but far from a complete one. Unfortunately, in the planning indicators of the protection of nature behind the average figures of the completeness of the extraction of minerals when mining and processing them was concealed the essence of the problem. When defending plans we usually argue about what this amount should be--75.1 percent or 75.2 percent for the branch. In the modern stage another approach to planning methods is needed. First of all it is necessary to have accounting that reflects the actual state of affairs and on the basis of this it is necessary to determine the tasks that are of national economic or large branch significance. An analysis of these will make it possible to achieve the greatest effect. It will be possible, for example, to solve problems of comprehensive utilization of mineral raw material which are now interdepartmental in nature and are linked mainly to difficulties in financing the work.

I cannot agree with the point supported by A. M. Bybochkin. Wholesale prices under the conditions of ferrous metallurgy reflect the rayon value that has been formed but not the national economic effectiveness of the utilization of raw materials.

Unfortunately, wholesale prices continue to be used to evaluate supplies. We see inexplicable examples where the lowest quality of ores are evaluated at the highest price (for instance, the Tkviril Depression magnesium ore deposit).

The discussion of problems of the economic effectiveness of the utilization of nature at the round table is timely and would undoubtedly contribute to the most drafted solutions to the crucial problems of the efficient utilization of natural resources.

#### Existing Wholesale Prices Reflect Payment for Natural Resources

Vitt, M. B., sector chief of the Scientific Research Institute of Prices of the USSR State Committee for Prices, candidate of economic sciences

The wholesale price system has already reflected the payment for the use of all natural resources: timber (stump payment); water (payment for taking water from water management systems); land (compensation for taking away agricultural land reflected in the estimated cost of construction of industrial enterprises and payments for recultivation of the land that are taken into account in the production cost for the extraction of mineral raw material); minerals (rates of deductions from the cost of extraction for geological prospecting work). The question of including payment for water in the system for procurement prices is being resolved. Therefore the statements heard here to the effect that the economic mechanism does not include payment for natural resources at all are quite unjustified.

Taken into account in the system of wholesale prices, this is based on the average expenditures for reproduction of natural resources. The prices now



provide for reimbursement of about 80 percent of the expenditures for augmenting mineral resources as a result of geological prospecting work, 100 percent of the expenditures on maintaining water management systems, 90 percent on the reproduction of forestry resources, and 100 percent on the recultivation of land disturbed by mining enterprises. At the same time many of the speakers do not wish to note the changes that have taken place in price setting and repeat what was being said 20 years ago when payment for natural resources actually was not taken into account in the practice of management, except for payment for tree stumps.

Now it is necessary to develop proposals for improving the mechanism for paid utilization of nature that has been in effect since 1982 and for certain natural resources even earlier.

Many economists see a "panacea" for all problems" in the introduction into the economic mechanism of the category "price of natural resources" which they define in value terms by analogy with capitalist management through capitalization of land rent. But they do not take into account the fact that in the modern stage of the development of commodity and monetary relations the effect of the overall law of land rent is limited directly by the social nature of production. Land and other kinds of natural resources are excluded from the sphere of commodity turnover and rents are taken from the utilizers of natural resources by the state not only through the price mechanism, but also with the help of the financial system of subsidies and direct taxation (fixed rent payments, free residual profit, turnover tax).

The directly social nature of the utilization of natural resources precludes the need for the operation of the category of their price. State interest is represented only by additional expenditures on the restoration of the required proportions in the production of the global social product, which can be disturbed by changes in the area of utilization or the exhaustion of natural resources. Expenditures on their reproduction in the form of discovering, assimilating, maintaining and improving them contribute to maintaining these proportions. Therefore we should speak primarily about more complete accounting for expenditures on such reproduction during the process of improving price setting.

Proponents of introducing the price of natural resources according to the principle of capitalization of rent frequently argue their viewpoint by saying that the level of estimated expenditures of natural resources is not so high as to influence the economies of enterprises and force them to utilize these resources efficiently. But it is not at all a matter of the level of the rates, although according to our calculations using the example of agricultural land allotted for construction, expenditure (reproduction) and rent (not including capitalization of rent) evaluations differ significantly. For the economy of the enterprise in general the level of estimates of natural resources are of no significance since all expenditures related to the payment for the utilization of nature are reflected in the planned production cost of the products of the enterprises. And it is time for us to change from arguments about the level of estimates to the development of a mechanism for influencing them. The problem here is not so much one of improving price setting as of developing the entire financial system and cost accounting. The

introduction of payment for the utilization of natural resources and to wholesale prices, as practice has shown, does not sufficiently influence the effectiveness of the utilization of nature.

The effectiveness of such payment is inseparably linked to the development of cost accounting and self-financing. The changeover to the reimbursement form of financing is necessary not only in the sphere of utilization but also in the reproduction of these resources. Enterprises of the Ministry of Geology, the Ministry of Land Reclamation and Water Resources and the Ministry of the Timber, Pulp and Paper and Wood Processing Industry are already working with funds that are coming from enterprises that utilize nature in the form of deductions for geological prospecting work, payment for water (in industry and agriculture) and payment for tree stumps. The financing of the enterprises of these ministries from the budget could be reduced by the sum of these payments. But in reality the Ministry of Land Reclamation and Water Resources has refused payment for their collection of water from water management systems by industrial enterprises and, judging from a recent discussion in LITERATURNAYA GAZETA, are against introducing a payment for water in agriculture. And yet this, along with payment for water in industry, would make it possible to make reimbursement through the prices and accumulate in the account of the Ministry of Land Reclamation and Water Resources expenditures on the maintenance and subsequent development of all water management and land reclamation systems. Organizations of the Ministry of Land Reclamation and Water Management would also have more responsibility for high-quality and prompt construction of land reclamation systems.

Self-financing has now begun to develop mainly in relation to two production factors--fixed capital and labor force. Natural resources are the third factor that is interchangeable with the first two. It is necessary to develop a model for changing over to self-financing with respect to all three production factors. Then enterprises will be able to compare the degree of utilization of each of them and select the most effective variant for their interreplaceability. Only this will create the possibility of increasing the effectiveness of payments for the utilization of nature and a need will arise for more complete reflection in the production cost of expenditures on the reproduction of natural resources.

#### Existing Wholesale Prices Are Unacceptable for Economic Evaluation of Deposits

Lukyanchikov, N. N., laboratory chief of the Central Scientific Research Institute of Ferrous Metallurgy, doctor of economic sciences

Research conducted by the Central Scientific Research Institute of Ferrous Metallurgy has revealed that the existing wholesale prices are unacceptable for economic evaluation of deposits of ferrous metals. In the first place they reflect the economic situation for the year of development of the price list and absolutely do not take into account the future, for example, up to the year 2000. In the second place they are established on the basis of average zonal expenditures which, in the final analysis, inevitably leads to an unjustified loss of part of the resources of ferrous metals. They do not make it possible to objectively evaluate, say, measures for reducing losses of

metal when extracting and processing ore. The introduction of these measures can be extremely effective from the national economic standpoint since they make it possible to eliminate from the balance of production and consumption of raw material the products of the worst deposit and thus provide for a reduction of expenditures on the production of metal, but they cannot be effective when evaluating products in terms of wholesale prices. In the third place, the application of wholesale prices violates the entire system of selecting optimal solutions in the mining subbranch of ferrous metallurgy on the basis of economic evaluation of the deposits since this way one does not assert the principle of compatibility of variants in terms of production volumes. In the fourth place, wholesale prices have a number of essential shortcomings (they do not reflect the metallurgical value of individual kinds of products, the level of their coordination among price zones and so forth), which distorts the indicators of the effectiveness of the utilization of ores from individual deposits. In the fifth place, wholesale prices do not make it possible to solve a number of important problems of development of the raw material base for ferrous metallurgy. Practically all deposits of ferrous metals that are located in favorable conditions are already being worked. The deposits that are being prepared for assimilation and reserve deposits, as a rule, are located in the worst natural conditions. Evaluations of the deposits according to existing prices in the majority of cases do not make it possible to include these supplies on the books. It has been possible to include the supplies from a number of deposits earmarked for assimilation only because they used calculated prices which are essentially different from wholesale prices or else operational and capital expenditures were reduced during the stage of technical and economic evaluation of temporary and permanent conditions.

The application of "Wholesale Prices of New Deposits" (as the USSR State Committee for Prices suggests) is also unacceptable for evaluating deposits since this distorts the indicators of the relative effectiveness of the utilization of various ferrous metals. A clear example is the establishment of conditions for calculating supplies of manganese ore in one of the deposits whose supplies are carbonates mixed with oxide ores. Oxide ores are the most valuable, raw material of the metallurgical industry which is in short supply and is rapidly being exhausted. When determining the conditions wholesale prices were applied for carbonate manganese ore concentrate developed according to the "Principle of Establishing Wholesale Prices for New Deposits," and the minimum industrial content of manganese in the oxide ores of the given deposit was taken at the level of 24 percent, and for carbonate--15 percent. As a result of this, according to the given principle, they are stimulating losses of highly effective oxide ores and giving preference to the less effective carbonate ores (the manganese content in the concentrate obtained from oxide ores is higher than in carbonate ores by a factor of almost 1.4-1.5. For example, by mixing oxide and carbonate concentrates and thus causing considerable harm to the economy, the enterprise receives additional profit. Thus the application of "Wholesale Prices of New Deposits" can lead to a disorientation of the national economy.

It does not seem possible to use wholesale prices to substantiate the need for implementing a number of economic measures in ferrous metallurgy that are of exceptional importance. Among them, for example, are the processing of



oxidized iron quartzite, comprehensive utilization of individual deposits, reduction of losses of metal during extraction and the processing of ores and so forth. The only acceptable instrument here are clothing expenditures.

When developing clothing expenditures a large role is played by the substantiation of the physical indicators of planning and accounting for the volume of production. Thus in the manganese ore subbranch of ferrous metallurgy, we suggest planning and accounting for output in terms of metals (manganese) in equivalent tons. By equivalent tons we mean that weight of their quantity which satisfies the same national economic need. The changeover from physical tons of manganese in concentrate to equivalent tons should be made through multiplying the former by coefficients of equivalency whose amounts can be determined as a ratio of total values of extractions of manganese from the corresponding kinds of concentrate into steel. In this connection it is necessary to revise the fundamental indicators of the subsection of the plan "Protection of Minerals and Efficient Utilization of Mineral Resources." In particular, extracting manganese in concentrate should be determined as the ratio between the quantity of metal in the concentrate in equivalent tons and the quantity of metal in the initial ore.

#### It Is Necessary To Develop Socioecological Concepts and Strategies for the Utilization of Nature

Pakhomov, V. P., sector chief of the Institute of Economics of the Ural Scientific Center of the USSR Academy of Sciences, candidate of economic sciences

The utilization of nature as a constituent and extremely significant part of the global problem of interaction between society and nature has been investigated intensively recently. But there is an obvious preponderance of utilitarian--applied developments and a clear lack of theoretical work, which should provide for an awareness of the principal socioecological concepts and strategies in the utilization of nature on the basis of revealing the most important parameters, connections and laws.

Efficient utilization of nature requires the establishment and maintenance of a dynamic functional equilibrium between the society and nature, and this is impossible without coordinating the structures and behavior of the interacting systems. Each of them creates for the other an environment for functioning and development by performing its own functions at the entry or exit to the other system. On this basis there can arise active forms of mutually advantageous "cooperation" between natural and economic-social systems similar to symbiosis, mutualism and so forth. Continuing this analogy one can note that the "ideal" of modern utilization of nature lies apparently in the area of a co-evolutionary path of development of nature and society.

Active forms of biosocial cooperation are, in turn, a prerequisite for the creation of a stable, deliberately controlled socionatural system. Such a theoretical concept predetermines a development strategy that precludes pollution of the natural environment and therefore the very category "Economic Harm From Pollution" (many of the speakers have discussed it), in our opinion,

is justified only for the existing condition of the development of the society, but for progressive technologies and new territories of assimilation this category will be meaningless. What should come to the foreground is the concept of the "quality of the environment. In this case the quality of the environment should be achieved by observing normatives for the protection of nature. Unfortunately, normatives for the protection of nature have not yet been developed for ecosystems. The existing sanitary-hygienic and fishing norms of maximum permissible concentrations have been calculated either for man or for individual species of fish and cannot be the limits for the ecosystem as a whole. For these purposes it is necessary to develop norms of maximum permissible ecological loads (PDEN). PDEN means that level of anthropogenic influence beyond which there is degradation or undesirable transportation of the ecosystem.

The determination of the permissible anthropogenic loads should be determined at the preplanning level. For instance, it is necessary to study the properties of the ecosystem and establish the load in the mineral-raw material sector of the economy from the earliest stages of geological prospecting work, that is, along with geological charts one should draw up charts of the ecological study of the territory. This will make it possible to adaptively evaluate the anthropogenic influence on the natural environment and, if necessary, to control it.

This method predetermines also the reproduction approach to evaluating natural resources. Obviously, in this case their socioeconomic evaluation should be constructed on the basis of value of natural components taking into account their restoration only for widespread and artificial ecosystems. For protected kinds of biotas (relict and endemic species and ecosystems) the evaluation should be based on a comparison of alternative variants that take into account the ecological limitations.

#### The Economic Mechanism of Land Reclamation Should Take Into Account the Long-Term Ecological Consequences

Grigoryeva, S. V., junior scientific associate of the Central Economics and Mathematics Institute

In Academician L. A. Melentyev's speech he raised the question of evaluating the activity of land reclamation organizations taking into account the planned productivity achieved on reclaimed land. While supporting this approach as a whole I should like to emphasize that not all increases in the productivity of agricultural crops as a result of land reclamation influence can be regarded as a positive effect. There can be a temporary increase in productivity achieved at the cost of inefficient land reclamation which in the future will lead to negative ecological consequences that bring about a reduction of the productivity of the land, a removal of the agricultural land from circulation and so forth.

The modern economic mechanism of interaction between land reclamation and agriculture does not take into account the long-term overall consequences of land reclamation influence. The work of land reclamation organizations is

evaluated on the basis of their current activity, and their financial position in the process of making decisions concerning future development of land reclamation as a whole and individual technologies do not depend on the long-term consequence of land reclamation influences, including the actual results of the development of the land reclamation branch in preceding years.

The long-term ecological consequences of land reclamation should be given attention, especially when determining the scope of the development of the branch as a whole and its individual territorial subdivisions and technologies. This means that the distribution of capital investments in land reclamation in various regions and for various technologies should take into account not only the results of the current activity and the expected effects, but also the consequences that are now appearing from the development of land reclamation in the corresponding regions according to the given technologies.

The Central Economics and Mathematics Institute has developed an imitation model of the long-term development of the land reclamation branch in a region with conditions of self-financing on the basis of technical and economic dependencies that characterize the influence of the scale of construction, repair and operational ameliorative activity on the condition of the land fund. As a result they established a permissible area which included those strategies for the distribution of finances among various kinds of land reclamation activity which does not worsen the dynamics of the average productivity on all land of the region and, consequently, the condition of the land fund throughout the extended period which is comparable in time with the existence of the land reclamation system (in the model--40 years). It was pointed out that incentives and financing for land reclamation according to the results of current activity contribute to the selection by land reclamation workers of those strategies for the distribution of resources which are frequently inadmissible from the standpoint of maintaining the quality of the region's land supply. At the same time the economic mechanism for interaction of the partners, which takes into account the long-term aspect of the functioning of the land reclamation branch, contains prerequisites for increasing interest in protecting land resources.

#### An Economic Evaluation of the Assimilation Potential of the Natural Environment Is Needed

Golub, A. A., junior scientific associate of the All-Union Science Research Institute of System Research of the USSR Gosplan and the USSR Academy of Sciences, candidate of economic sciences

At the present time almost nobody has any doubt about the need for an economic evaluation of natural resources. Theoretical work has been done in this area for a long time and the result of this has been the development of the rent concept of evaluating natural resources and objects of the utilization of nature. The underlying principles are reflected in the Temporary Standard Methods for Economic Evaluation of Deposits of Minerals, the Methods for Economic Evaluation of the Most Important Kinds of Natural Resources in the CEMA Countries, and a number of other methodological guidelines that are being prepared. But the element-by-element approach toward which these documents are oriented does not make it possible to evaluate the useful properties of

ecological systems as integral formations. In particular, the authors lose sight of one of the most important characteristics of the surrounding natural environment—its assimilation potential.

In literature one more and more frequently encounters works whose authors address the problem of a quantitative determination of the limits of stability of the ecological balance, and volume indicators that characterize the assimilation capacity of the territory with respect to various kinds of pollutants. At the same time only a few authors raise the question of changing over from physical indicators to their economic evaluation.

One should especially single out the work of K. G. Gofman, who has approached this problem most consistently, but he answers far from all the questions.

On the methodological plane the essence of the economic evaluation of the assimilation potential is of great interest. In our opinion, it is based on differential rent. In the first place, the source of the formation of the evaluation of the assimilation potential is the differential income. The basis of this are the savings on environmental protection expenditures (waste in volume that corresponds to the assimilation capacity of the territory that are decontaminated naturally). The role of closing expenditures when determining the differential effect is played by the maximum environmental protection expenditures in the given region which, as we know, are optimally equal to the maximum harm from the deterioration of the quality of the environment caused by pollution. Individual expenditures for "operation" of the assimilation potential are zero (or close to zero) since the natural process of decontamination of pollutants and compensation for the anthropogenic influence practically do not require man's intervention. As a result, the differential approach actually turns out to be equal to the product assimilation capacity of the environment and the maximum environmental protection expenditures (the maximum damage). In the same place, another necessary condition for the appearance of differential rent is met: the effect from utilization of the assimilation capacities of the territory is stable in time. The guarantee of stability is the inertia of technological sets of the production system of the region which is expressed in the impossibility of rapidly changing over to waste-free and reduced-waste productions that make it possible to reduce the volume of waste to a level that does not exceed the assimilation potential.

The observance of the required conditions does not mean automatic formation of differential rent. There must be a reason to justify its appearance, and this can only be the existence of a monopoly on a "rent-receiving" resource as an objective of management. Such a monopoly exists if there is a subject that has been given the right to complete control over the discharges of the enterprises located on the territory of the given region. Control over discharges is an adequate form of control over the utilization of the assimilation potential. In order to perform this function it is necessary to have a specialized management agency with a ramified network of branches whose functions, in particular, would include making up to the direct users for the loss of natural resources and control over their utilization and the quality of the environment. Such an agency, by exacting payment for discharges from polluting enterprises would concentrate differential rent in its own hands--

the equivalent of the economic evaluation of the assimilation potential. Consequently, control over discharges and exacting payment for them is not only a factor that stimulates efficient interaction between economic and ecological systems, but is also a most important condition for the formation of the economic evaluation of the assimilation potential. Of course, other forms of control over discharges are also possible (without exacting payments), for example, the establishment of quotas for each enterprise. But then the income from the assimilation capabilities of the territory will be disbursed, which impedes its utilization. The funds coming in in the form of payments for discharges exceed the amounts of the economic evaluation of the assimilation potential of the region by the amount of harm caused to the recipients. These funds should be transferred into the budgets of the local agencies or be used for compensation for harmful effects caused to the population or to the production capital as a result of polluting the environment. The remaining funds, like differential rent, which appear in other spheres of the national economy must be put to use for the society.

The application of an economic evaluation of the assimilation potential (as, incidentally, any other kind of natural properties and resources) in the stage of planning estimates and as an element of the economic mechanism for the functioning of the economy is unthinkable without systematic restructuring of planning and management which is directed toward objectivization of economic relations and realization of principles of efficient management.

#### The Strategy for the Utilization of Nature Should Rely on Scientific and Technical Progress

Chernegov, Yu. A., doctor of technical sciences, section chief of the Council for the Study of Productive Forces Under the USSR Gosplan, doctor of technical sciences

Before speaking about a state committee for protection of nature it is necessary to understand the policy it will conduct and before speaking about sanctions and incentives it is necessary to know what we wish to achieve. First we must determine where the negative influences on nature are coming from, their initial causes.

We say: The Ministry of Power and Electrification and the Ministry of Ferrous Metallurgy are polluting the environment, but where are they acquiring that with which they pollute?

The initial source of pollution is the utilization of raw material. The primary one is mineral raw materials. Twenty billion tons of rock are extracted from the earth each year, of which the useful minerals comprise 5 billion tons, and all the rest is stripped rock that goes to the dumps. Moreover, when processing minerals one forms tailings, ash, slag and so forth. The next source is agriculture: of the 2.3 billion tons of biomass that are produced, 225 million tons are useful products; to this one must add 1.5 billion tons of products of erosion that arises basically as a result of agricultural activity. In third place forestry and the pulp and paper and wood processing industry, which takes about 0.5 billion tons of biomass from



nature and produces products in a quantity of 26-27 percent of the initial material.

The mining industry is now proposing the slogan of changing over to reduced-waste and waste-free technologies. But in fact this is unrealistic because 15-16 billion tons of waste which are not salvaged simply cannot be processed because nobody needs this quantity of products. These questions can be resolved in no other way than through a radical restructuring of the economy. In our opinion, this is a matter of hypertrophied development of the mining complex. If we take the customary path, within 20-25 years it will be necessary to create a potential for the mining industry that is equal to what has been accumulated during the entire past history of our state--because of the exhaustion of mineral resources at existing enterprises. Such a path is unacceptable. It is necessary to search for possibilities of reducing the resource-intensiveness of our economy.

To this end we have utilized the modern theory of transformations.<sup>3</sup> This theory singles out four kinds of transformations in terms of their content and economic results. The first is a change in the structure or the discovery of new areas of application; it produces increased effectiveness of work by factors of 10-100-1,000. The second--the utilization of new principles--provides for an increase in the economic effectiveness by a factor of 2-10. The third--new design solutions--produces an increase in economic effectiveness by 10-15 percent; it also includes reduced-waste technology. The fourth--calculation and optimization of the parameters of the systems--contributes to increasing the economic effectiveness by 2-10 percent.

Analysis shows that it is possible to find a radical solution to these problems: we must use as little raw material as possible. This will require an entire complex of measures. It is necessary to create new technological structures: for example, in construction it is necessary to use less reinforced concrete and use slag and construct structures with fewer stories, elevators, cranes, and so forth. We must take the path of sharply improving product quality. One ton of myopium as a binding substance produces a savings of 20,000 tons of ordinary steel. New principles in technology, for instance, metallurgy without blast furnaces simultaneously provide for the observance of the corresponding PDK's and PDV's. Calculations have shown that this complex of measures would make it possible at the modern level of production to reduce the consumption of steel for the same amount of final product by 60-70 percent.

Hence it follows that the economic mechanism for efficient utilization of nature should be based on the economic consequences of applying the theory of transformations.

In connection with this one can discuss the Committee for the Protection of the Environment. Is it really hard to understand that the radical problems we will have to resolve in the near future are within the competence of the Gosplan?

The economy should be structured in such a way as to provide for simultaneous solutions to economic and ecological problems. In principle we see that paths to solving ecological problems. They are complex and they should be the object of the system of planning which is now being perfected in light of the decisions of the 27th CPSU Congress.

#### We Need Standards That Regulate Procedures for Achieving Goals of the Utilization of Nature

Rozovskiy, B. G., deputy chief of the Voroshilovgrad Branch of the Institute of Economics of Industry of the UkrSSR Academy of Sciences, doctor of jurisprudence

We are exaggerating the legal status of standards too much, although in jurisprudence they are still included among the so-called technical-legal, and not purely legal norms. The main shortcoming of standards is the fixing (mainly) of requirements in terms of the final result.

Yet theory and practice show that these kinds of requirements that are not reinforced by regulation of procedures for achieving them, as a rule, are not very effective. These remarks pertain equally to normatives of PDK (PDV).

By analogy with the rules for safety techniques, where each final goal is provided with a system of procedures for achieving it and operation-by-operation verification, apparently, it would be expedient to create a new category of procedural standards which would regulate the procedures for the observance of the most important GOST's--the final goals, including the goals of the utilization of nature. Possibly these documents should not be given the status of standards, but they can be called "Rules for the Protection of Nature During the Process of Production Activity."

Continuing this thought, I should like to focus attention on the need for maximum expansion of regulative norm creation in the sphere of the utilization of nature as opposed to all kinds of sanctions. The role of sanctions has now been clearly exaggerated, although it is known that their force has at all times been too great. Let us recall a historic fact: in France about 150-200 years ago when the death penalty was introduced for picking pockets, the largest number of these crimes were committed from the pockets of idlers who had gathered in front of the scaffold.

Property sanctions for violation of environmental protection legislation are not effective enough either.

First of all it is necessary to establish the lack of identity of national economic and cost-accounting interests in preserving and improving the quality of the environment. Calculations show that under conditions where expenditures on construction of purification installations and other environmental protection equipment reach 40 percent of the value of fixed capital, in order to ensure that sanctions play a stimulating role it is necessary to increase them to fantastic amounts. Including sanctions directly in incentive funds leads to a destabilization of the fulfillment of the plan

in other spheres--construction of housing for workers, children's institutions, health facilities, clubs, improving working conditions, updating equipment and so forth.

In management practice are examples where the payment of large sums by the enterprise to make up for damage that was caused has involved holding up the environmental protection program for a fairly long period of time, which was necessary in order to obtain additional financing for these purposes.

It is time to change over from collective responsibility to personal responsibility. In violations of contractual discipline, inefficiency, and lack of initiative the guilty party is not the collective, but a specific worker whom they do not even try to find with collective forms of responsibility and incentives. It is necessary to strengthen planning levers and improve the system of personal legal liability. Effective stimulation of the utilization of nature can be achieved only through improvement of the economic mechanism, having brought the incentives closer to the specific worker.

#### Taking Into Account the Assimilation Potential of the Environment

Bykhovskiy, A. V., senior scientific associate of the All-Union Scientific Research Institute of Medical and Medico-Technical Information of the USSR Ministry of Health, doctor of medical sciences

The shortcomings in the area of information provision for controlling the quality of the environment should include first and foremost the lack of indicators that characterize the assimilation potential of the environment in a given region. It is very important for the resource holders and the resource users to know the amount of the "unrecognized" resource--the assimilation capacity of the environment. After the statement I. Ya. Gogolev and I made regarding this issue at the conference at the MGU in 1978 a number of articles on this subject appeared abroad. In particular, one Canadian researcher quite reasonably wrote that the capability of underground wells to absorb liquid wastes is a no less important natural resource than the supply of gold.

Unfortunately, nobody is engaged in a determination of the assimilating capacity of the air, water and soil in various regions, although the knowledge of this resource is of primary importance for agencies for controlling the quality of the environment, mainly from the standpoint of increased economic effectiveness of the utilization of nature.

In optimizing the conditions for man's existence it is necessary to proceed not only from economic, but also from hygienic optimization, including the possibility of harmful influence of the environment on man's health. It is necessary to recall more frequently the term "common sense" which has been known since ancient times but, unfortunately, is frequently forgotten when evaluating individual consequences of our actions. For example, when creating artificial seas in the southern latitudes they have not sufficiently taken into account the consequences for people, the majority of whom do not wish to



live near such seas, and for agriculture, which is deprived of productive fields that end up under water.

It is necessary to think about the remote consequences of large measures in the area of the economy when distributing enterprises and villages and when creating "harmful" productions. This is shown by the situation that developed in one of the cities. Here, in spite of active measures that were taken, including for planting greenery, the population is practically not growing because the air there is polluted with foul-smelling substances. The unfavorable ecological situation where the residents are forced to abandon these places. A unique situation arose at the plant itself. The old workers are going on pension and there is no compensation at all for youth. Therefore engineers who are sent for this production are forced to perform the work of welders.

The time is coming when concern for improving the environment will be not only evidence of the concern for man but also a condition which determines the very existence of one production or another. This is a new situation and it should be deeply understood not only in the moral-ethical and gnosiological plane, but also on the economic plane.

#### Methods of Optimal Planning--A Constructive Instrument for Increasing the Effectiveness of the Utilization of Nature

Gold, G. S., chief of the sector for economics and information of the Central Scientific Research Institute of Nonferrous Metallurgy, candidate of technical sciences

In the statewide program for the protection of nature and efficient utilization of natural resources primary attention should be devoted to the main provisions for the development and utilization of workable methodological and calculation instruments for selecting the best of the possible resource alternatives (here and henceforth we are speaking about the sphere of the utilization of nature which is related to the country's mineral and raw material base.

In our opinion, the most diverse aspects of the utilization of nature--reduction of losses of minerals in all areas, increased comprehensiveness of the utilization of raw materials, accounting for the basic production factors in the assimilation of resources, substantiation of conditions, establishment of sequence for the assimilation of deposits of minerals, selection of variants for the development of mining industries, interrelations with the world raw material market and so forth--can be represented in general form as a unity of interconnected resource alternatives. As a design for the scientific instruments for comparing the effectiveness of the aforementioned alternatives from national economic positions it is suggested that one use the methodology for comprehensive, systemic economic analysis, the pivotal point of which are branch optimization models.

It is precisely on this basis in each of the optimization problems that are being resolved one jointly realizes the principles of the optimum,

comprehensiveness and integrity of the planning decisions that are being developed. This approach makes it possible to comprehensively study the interactions of the key raw material, technological, production, economic, economic-geographic, socioeconomic, ecological and other factors in the development of the mineral raw material branches. In each case the branch (subbranch) model acts as a centralizing one for all the basic aspects of the long-term plan, which corresponds to the very nature of the planning basis in a centralized economy.

The mineral raw material branch should be regarded as a large socioeconomic system for which optimization of long-term plans is a mandatory condition for radically improving planning and increasing its economic effectiveness. It must be mandatory to promptly inform the USSR Ministry of Geology of the results of calculations concerning optimization of branch plans for the extraction ministries, which should produce a large-scale economic effect in the sphere of resource provision.

During the course of many years of research extremely significant (from 25 to 55 percent) differences were discovered in the selection of resource alternatives with the traditional approach and in the case of the utilization of methods of optimal planning. This shows the need for extensive changeover from local to systemwide evaluation of the diverse resource alternatives. This conclusion is of a fundamental nature. In essence, we are speaking about a new paradigm for the selection of optimal intercoordinated variants of resource provision, resource utilization and resource consumption exerts an influence not only on the solutions to a broad range of problems of development of the mineral-raw material branches, but also the strategy of planning geological prospecting, planning-design and scientific research work. A basis is created for providing for integrated research of raw material, technological and economic alternatives on the basis of the objective requirement of the modern stage of socioeconomic development: an active changeover to the intensive type of utilization of mineral resources..

Thus it seems necessary to create a comprehensive target program for optimization of long-term planning of mineral-raw material branches. It should clearly indicate who is personally responsible for its implementation, what the rights and responsibilities of the developers are, who bears personality responsibility for the organization of optimization work, what organization is developing the legal foundations of the functioning of the complex of optimization work and incentives for the collective that performs this work, and so forth.

It is necessary to strengthen and deepen the expert evaluation of the initial data and results of optimization calculations. First and foremost one should deeply substantiate the ecological evaluation and make it more effective, especially in regions where unique sources of nature are located and in zones with increased danger, for example, in seismographically active zones where it is necessary to devote special attention to coal from slopes of sides of deep mines, and so forth. In our opinion, with each stage-by-stage consideration of the planned developments for the corresponding nature utilization objects it is necessary to have additional refinement of materials from ecological evaluations. In the process of the expert evaluation of the plan for a mining

enterprise there should be a simultaneous expert evaluation of the plan for urban buildup (the built-up zone around a mining enterprise which appears because of the creation of the extraction facility).

It is necessary to analyze more deeply and take into account more fully the time factor, which is of special significance in planning the development of mining production. Here it is expedient and sometimes even necessary to develop not only long-range, but also medium-range predictions. We have experimentally discovered an essential mutual influence among resource alternatives in the medium-range, long-range and superlong-range future (for example, the development of the Norilsk Mining and Metallurgical Combine was worked out up until the year 2020). Of course, in order to develop optimal decisions in each of the three aforementioned periods, it is necessary to create adequate approaches, methods and models. The 15-20 year period is optimal for calculating long-range plans. But in any case even for the superlong-range future it is necessary to give resource alternatives a systematic quantitative evaluation, following the well-known rule of measuring everything that can be measured and making that which is inaccessible to measurement accessible.

Here, in our opinion, a numerical evaluation can and should be obtained not only for the aforementioned factors, but also for the strategy for developing, including those for which the initial values of key characteristics of the economic dynamics cannot be simply given. The compared alternatives can and should be given a quantitative and qualitative evaluation during the process of the operation of the complex of branch optimization calculations constructed on the basis of methodological principles of the theory of optimal functioning of the socialist economy.

#### A Completely Different Methodology Is Needed

Podolskiy, Ye. M., senior scientific associate for the Council for the Study of Productive Forces Under the USSR Gosplan, candidate of technical sciences

In order to carry out the task of accelerating our country's socioeconomic development it is necessary to make greater demands on efficiency in work. This is also the angle from which we must view the basic economic documents--methods, instructions and guidelines, and analyze how well-substantiated they are on the theoretical and methodological plane.

From these positions the Methodological Guidelines of the USSR Gosplan for the Development of State Plans (1980) and the temporary Standard Methods for Determining the Economic Effectiveness of Capital Investments (1980) seem extremely vulnerable and inconsistent. Their recommendations are internally contradictory and eclectic. It turns out that when making decisions at various levels and even at the same levels of management of the national economy, one can use various criteria of economic effectiveness although it is quite obvious that under the conditions of the activity of these production subsystems (shop--enterprise--production association--branch--region--republic) formally (logically) there is no difference and no grounds for applying different criteria. The guidelines recommend determining both the

"absolute" and "relative" effectiveness, using a whole set of indicator-criteria (the ratio between net and normative net output, profit, reduction of production costs and capital investments; carryover expenditures and so forth). Moreover, in planning they recommend certain criteria for effectiveness and for summing up the cost-accounting results of the activity of the enterprises they use others. Under these conditions scientists, designers and planners frequently come up with one solution to a problem while planning agencies come up with another, and managers of enterprises still another, so that one and the same machine or variant of a draft of a plant (technology) or one and the same variant of a plan for development of the branch or the republic in terms of one criterion is the most effective while in terms of another, conversely, it is the least effective.

In this connection attention should be given to the first sections of the draft of the Comprehensive Methods for Evaluating the Economic Effectiveness of Economic Measures Prepared by the USSR Academy of Sciences (1982). Here they suggest a unified economic criterion for effectiveness for all levels of management. And if one were to remove all the numerous additions and appendixes, it could become the foundation for restructuring in this area.

We have a fairly good document--the draft of the methods for economic evaluation of the most important kinds of natural resources, the last variant of which was prepared in 1984, but it has not yet been approved. The branch closing evaluations of the initial products of the branches that utilize nature are necessary not only for iteration and decentralized comparison for the plan for the development and distribution of the national economy, but also in cost accounting. These estimates can be used as secondary, "shadow" prices according to the following schema for payment for resources that are expended.

$$I = \bar{c}v_{pl} + c_1(v - v_{pl}), \text{ rubles per year}$$

Here  $\bar{c}$  and  $c_1$  are the average branch price and the closing estimate;  $v_{pl}$  and  $v$  are the planned (normative) and actual expenditures of raw material in production. Here the normative expenditure of raw material is paid for at the average price, but deviations from it (overexpenditure or savings) at the closing price, which is usually considerably higher. In other words, for overexpenditure the enterprise is fined and for saving it is rewarded. This system of payment for raw materials (and also products that are produced) removes the contradiction between prices of the plan and interests of cost accounting.

I shall touch on one more document--the temporary standard methods (1983). According to these methods the economic effectiveness and, in keeping with it, the sequence of introduction of purification installations and other measures for preventing (reducing) pollution of the environment should be determined by a comparison of expenditures on them and the "harm that is avoided." The latter is determined as the sum of expenditures: a) of other enterprises using polluted resources; b) the state, related to increased illness of the population (payment for bulletins, incomplete development of products) arising in the event of the absence of the purification installations that are being evaluated. And if the expenditures are less than the "harm that is avoided,"

this measure is economically effective and should be taken before those for which the expenditures are higher than the "harm" and so forth. The complete socioeconomic groundlessness and vulgarity of such an approach is obvious. It is inadmissible to express the loss of people's health in rubles and juxtapose these to expenditures on iron, electric energy and so forth. Such an approach can lead to making decisions that are to the detriment of the people. For example, let us say that we have only one set of gas purification filters, the total expenditures for which are equal to 100,000 rubles a year. When they are installed in Region 1 the "harm" that is avoided is 130,000 rubles a year, and in Region 2--70,000 rubles a year. According to the methods, these filters must be installed in Region 1. But it is quite possible that Region 1 does not have much population and "expenditures on bulletins" will amount to only 20,000-30,000 rubles, while in the densely populated region too the occurrence of illness is much greater and the 70,000 rubles goes almost entirely for paying for bulletins! Moreover, what about trees and birds? And in general, why is it called the "temporary standard methods for determining the economic effectiveness of the implementation of measures for the protection of nature..." if nature is not protected?

It says in these methods that they were developed by the Combined Commission of the USSR Academy of Sciences and the State Committee for Science and Technology for economic evaluation of natural resources and measures for protecting the environment and the scientific council of the USSR Academy of Sciences for economic effectiveness of fixed capital, capital investments and new technical equipment, but they have not been discussed in the plenary meetings of these organizations. In the process of consideration and approval of these methods I delivered protests to the chairman of the combined commission and his deputy, but without results. It is necessary to return to general consideration of the methods and, I think, revoke them.

We need methods which will provide for organized, planned (in stages) reduction of the level of the pollution of the environment in keeping with recommendations of sanitary-hygienic and biological services, taking into account the varying degrees of danger for the health of people when they PDK's of various substances are exceeded) and will provide this with minimum expenditures!

#### Upgrading the Economic Mechanism for the Utilization of Nature

Gofman, G. K., laboratory chief of the Central Economics and Mathematics Institute, doctor of economic sciences

Economizing on resources is not only an important factor in the intensification of economic development, as a result of which more than one-fourth of the national income is to be obtained under the current five-year plan. It is also a basic prerequisite for improving the condition of the natural resource potential, above all preventing pollution of the environment. Therefore it is precisely toward solving problems of economizing on resources that our proposals for improving the utilization of nature should be primarily directed. The main thing here, it seems to me, is not the formation of new administrative agencies, but the development of an economical "climate" that



stimulates resource-saving measures in each work place. At least four conditions are necessary to create such a climate.

First: A payment procedure for reproduction and utilization of natural resources, and payment for them should provide an advantage for taking the most resource-saving measures that are based on the achievements of scientific and technical progress. Can one speak seriously about economizing on petroleum, for example, if with the existing prices for petroleum new methods of increasing the petroleum output from beds are unprofitable?

Second: Truly intensive resource-saving is impossible without changing over to wholesale trade in means of production. Collecting supplies of resources will promote concealing them and not economizing on them.

Third: The contribution of resource-saving to the increase of profit of production associations should be comparable to the role of resource-saving in the increase of the national income, and the rights of associations to dispose of additional profit from resource savings should be reinforced materially, that is, it is necessary to guarantee the associations satisfaction of their effective demand for all kinds of production resources.

Fourth, the policy for resource-saving should be extended also to such a resource as quality (assimilation potential) of the environment, that is, the utilization of this resource too should be organized on a basis of payment.

It seems to us that meeting these conditions will help provide a favorable economic climate for resource saving. It is possible that they are not enough, but they are necessary and, as one can easily see, they are an indispensable element of the reform of the mechanism for control of the national economy as a whole. Restructuring of management of the economy on the basis of complete cost accounting is, in our opinion, the main lever for resource saving and, correspondingly, for improving the utilization of nature in the country. It is precisely "through the prism" of new conditions of management that one should, in our opinion, evaluate all the proposals for improving the system of control at the utilization of nature. Here, as in all other spheres, it is necessary to strengthen the centralized planning basis, but mainly on the basis of the application of economic methods of management. The creation of new management agencies and the strengthening of regulation "from above" of the environmental protection activity of economic organizations can also turn out to be necessary, but these measures should be organically included in the new conditions for management and not be regarded as decisive in the manner of improving the control of the utilization of nature.

It seems to us that economic methods comprise the basis for the development of regional control of the utilization of nature. Increasing the responsibility of republic and local soviet agencies for the condition and utilization of the natural resource potential on the territory under their jurisdiction should be reinforced by introducing principles of cost accounting in "nature utilization" in relations between branch and territorial management agencies (payment for the utilization of nature and self-supporting measures for the protection and improvement of regional natural resources).

If one is to speak about the primary tasks for upgrading the economic mechanism for the utilization of nature, I would focus on two interconnected problems: the changeover to planning final results of the utilization of nature and the introduction of cost accounting method for controlling environmental protection activity of production associations (enterprises).

One of the most important final results of the utilization of nature as a kind of economic activity is the maintenance of the necessary qualitative and quantitative characteristics of the natural resource potential in the country as a whole and in the regional cross-section. Up to this point there are no corresponding generalizing indicators either in statistics or in planning. The development of a system of such indicators and the methodology for determining them for purposes of accounting, planning and economic incentives is, in our opinion, extremely crucial. The resulting indicator of the environmental protection activity of the enterprises would be their contribution to the achievement of the normative level of cleanliness of the environment. This contribution is determined by the number of technologies for prevention using resource saving, and water purification and gas removal installations for harmful discharges into the environment. In physical terms this is the quantity of eliminated discharges taking into account their toxicity, the conditions for their dispersion into the environment and a number of other factors. With the help of a system of coefficients contained in the temporary standard methods (1983) it is now possible to calculate the amount of prevented discharges not in weight (volume) units, but in conventional tons, that is, taking into account their harmfulness (negative usefulness). In other words, now we can at least approximately calculate the "product" of environmental protection activity in physical terms. Methods have also been developed for determining environmental protection expenditures as part of the production expenditures of the main branches that pollute the environment. Consequently, we have the necessary prerequisites for changing over to cost accounting methods of controlling the environmental protection activity of the enterprises. Such a changeover can be achieved through introducing deductions into the regional fund for protection of the environment (RFOOS) as part of the expenditures on the production of products by the enterprises that pollute. Environmental protection expenditures are not included in the estimated expenditures on production and are reimbursed from the RFOOS fund at special prices per conventional ton of prevented discharges. The regional management agency in this case as much as "purchases" the products of the environmental protection subdivisions of the enterprises. It is important to emphasize that the proposed changeover to cost accounting conditions for the functioning of environmental protection subdivisions can be carried out without changing the existing prices for goods and services of the polluting branches and without changes in the balance of income and expenditures of state and local budgets. In order to meet these conditions it is necessary and sufficient for the RFOOS to be formed in the amount of the planned environmental expenditures and the established normative of profit in terms of the expenditures of the polluting enterprises within a given region. The normatives for deductions into the RFOOS can be established in percentages of the production cost of the products (minus environmental protection expenditures) or, which is preferable, in proportion to the

residual (going into the environment) discharge of pollutants in conventional measurements.

The proposed variant of the organization of cost-accounting activity will provide for the formation of profit of environmental protection subdivisions taking into account the ecological effectiveness of their work (the volume and harmfulness of the discharges that have been prevented) and the completeness of the salvaging of raw material and fuel in the technological processes that are being used will influence the profit of the basic productions. The intensiveness of the influence of new economic levers--payments for pollution that has been allowed and has been prevented--on the cost-accounting results of the production and environmental protection activity depends, all other conditions being equal, on the level of the payments that have been established. In this plan it is predetermined by the requirement for maintaining the existing level of prices and budget balance. In the future it can turn out to be necessary to raise the level of payments for pollution that is allowed and that has been prevented, taking into account the economic harm that has been caused or has been avoided. It would be useful to conduct ecologico-economic experiments to reveal the most expedient forms and methods of introducing cost accounting into the control of environmental protection activity.

## Conclusion

Fedorenko, N. P., Academician

I do not intend to sum up the complete result of the statements we have heard here--they have been interesting and contained profound, frequently paradoxical, and sometimes even extremely debatable ideas. Everything said here needs to be interpreted, carefully studied, and, since it is published, it will undoubtedly give impetus to new research and practical recommendations.

Permit me to share only a couple of considerations that have arisen during the course of the discussion.

Everything economical is ecological, and everything that is ecological is economical. Apparently all participants in the round table discussion agree that today this assertion does not reflect the real state of affairs, and many doubt the very possibility of achieving such a situation. In the long-range aspect the economic and ecological well-being of the society are synonyms. Consequently, the primary cause of collisions between ecology and economics is a conflict between long-term and immediate socioeconomic interests of the society. Problems of economics of the utilization of nature amount in the final analysis to coordinating the interests of present and future generations. The central task is to substantiate socioeconomic mechanisms that combine as much as possible the current economic interests of labor collectives and branch and territorial management agencies with long-range ecological goals. It is clear that 100 percent compatibility is impossible here and everything that is ecological cannot always and everywhere be economical. But the opposite is equally obvious--we are only beginning (and



quite timidly) to put to work the levers for combining ecological and economic interests, the main one of which is payment for the utilization of nature and economic methods of controlling the reproduction and utilization of the natural resource potential. The experience existing in our country, for example, in payment for the utilization of water in irrigation farming has already proved its ecological effectiveness. V. I. Danilov-Danilyan said here that payment for the utilization of nature is related to the tendency toward expanding the sphere of operation of monetary and commodity relations, but this is not enough, and it is "necessary first of all to control the content and regulate the processes taking place outside the economized sphere." I think here we should talk not about what should be developed "first and foremost"--commodity-monetary relations or controlled and direct regulation--but of comprehensive improvement and interpenetration of the two mechanisms.

It is important to overcome the gap that is forming between the level of development of recommendations concerning the solutions to a number of inherent ecologico-economic problems and their introduction into economic practice. I completely support both the idea expressed by P. I. Poletayev concerning the need for more active participation of scientists in the solutions to crucial practical problems of economics of the utilization of nature and the points that were made in the statements by M. I. Agoshkov, B. G. Rozovskiy and other comrades concerning more intensive utilization by practice of the results of scientific research.

A couple of words concerning the criticism of the Temporary Standard Methods (1983) that were heard at our round table. I recall that these methods are not the first of the documents of this kind. As early as 15 January 1980 the first deputy chairman of the USSR Gosplan, V. Ya. Isayev approved as temporary the methods for determining the economic effectiveness of expenditures on measures for protecting the environment.<sup>4</sup> But this document was not utilized in practice mainly because it did not contain the necessary apparatus for doing calculations with respect to information the planning agencies actually had. The temporary standard methods (1983) contain this apparatus and therefore practical calculations are made according to them. This is precisely because these methods are supplied with developed formulas, numerical values of initial coefficients and so forth, they are used to conduct numerous calculations whose results are used in planning practice. Correspondingly, there also appears the possibility of constructive critical analysis of this document and the discovery of ways of improving it. There is no doubt that the temporary standard methods (1983) are vulnerable to criticism, mainly because we do not now have the necessary information base for a reliable evaluation of social or other consequences of anthropogenic disturbances of the environment. This was convincingly discussed here by M. A. Styrikovich and B. A. Knizhnikov. I think that A. M. Styrikovich is close to the truth when he estimates necessary expenditures on the creation of such a base at about 1 percent of all expenditures on the protection and efficient utilization of natural resources. I will add that we must inevitably speak about many years of research. Therefore it will be possible to obtain more reliable data concerning economic estimates of medical and biological and other consequences of disturbances of the environment as information is accumulated concerning the "natural" amount of these consequences. As concerns the methodologies for economic evaluation of the "natural"

consequences themselves and their utilization in ecological-economic substantiations, I should like to note that none of the speakers here has refuted the methodological principles of the temporary standard methods. The only exception was Ye. M. Podolsky, who long ago--including in the state expert evaluation of this document--spoke out and still speaks out against its methodological basis--the comparison of the economic disturbances of the natural environment and expenditures on preventing them. Unfortunately, Ye. M. Podolskiy stubbornly refuses to take on the work of an attentive reading of a document which he has criticized so sharply. Therefore he asserts that according to the methods the selection of variants can be carried out "to the detriment of people," since "it is not admissible to express the loss of people's health in rubles and compare them with expenditures for iron, electric energy and so forth." First of all let us note that according to these methods the selection of the variant of the environmental protection measures is made according to criteria of maximization of the economic effect but with the mandatory condition of the observance of the established requirements for the quality of the environment--medical-sanitary and other norms (see Points I.5 and III.3 of the methods). Therefore there can be no discussion of any choice "to the detriment of health." Ye. M. Podolskiy's superficial acquaintance with the document he criticizes is also shown by the fact that the "payment for bulletins," according to his assertion, is the basic constituent of the economic harm from pollution of the environment that is calculated in the methods, although in reality, according to these methods, the payment for bulletins is not taken into account at all as part of the harm from pollution. The economic evaluation of health is necessary--this was convincingly discussed here also by an authoritative representative of medical science, B. A. Knizhnikov. It is necessary not--as Ye. M. Podolskiy naively assumes--to compare health with iron, but in order to provide for the greatest improvement of health from the natural economic resources expended for these purposes, including resources of "iron."

I should like to emphasize that the new apparatus for our planning practice--closing expenditures, norms of effectiveness of the utilization of natural and labor resources, economic evaluations of social factors and so forth--arise not out of abstract model construction but from new needs of practice itself. It is typical that criticism of this apparatus is limited to general considerations about its imprecision and inadequate substantiation, but does not suggest any alternative methods (unless one includes evaluation according to existing prices, whose unacceptability has already been sufficiently discussed). There are very many examples of the substantiation of specific, say, mining-economic solutions with the help of closing expenditures, but I do not know of a single case in which a different, but equally specific solution with good argumentation was suggested as an alternative to this one with the same initial preconditions.

The main imperfections in the methods being applied for determining the economic effectiveness of resource-saving and environmental protection measures lie not only (and not so much) in the fact that we have a poor knowledge of such consequences of anthropogenic violations of the natural environment as damage to health, acceleration of corrosion, reduction of the production of the fields and so forth. The essence of the problem lies in the fact that calculations of effectiveness have become "bogged down" in the

planning stage, and in the effective economic mechanism there are essentially no cost-accounting analogues to rent evaluations of natural resources, evaluations of economic harm from pollution of the environment and so forth. Consequently, there is no "feedback" between the actual economic normatives that are used in planning. If in addition to this one take into account the fact that the existing economic mechanism motivates the enterprises to increase and not reduce expenditures, including expenditures brought about by exhaustion of the natural resource potential, one begins to understand that a radical improvement of the methodological base for calculations of economic effectiveness of the utilization of nature can be achieved only as the economic mechanism as a whole is improved and the role of economic methods of management of the national economy increases. Until rent payments become an organic part of the economic mechanism of the anti-expenditure type that is being created now, it is extremely necessary to use these "mutually critical" instruments, to use Yu. V. Sukhotin's expression, and they must be used extremely precisely. In keeping with the methodological documents, it is necessary (here I agree with V. I. Danilov-Danilyan) to stipulate much more precisely the rules for the application of the new instruments, taking into account the purely approximate nature of the existing quantitative evaluations and the new conditions of management that are now taking form in the sphere of the utilization of nature.

Summing up the results of our discussion, one can formulate the basic areas for improving the control of socialist utilization of nature in light of the decisions of the 27th CPSU Congress.

First of all, it is necessary to strengthen the centralized basis in control of the utilization of nature, which requires overcoming the mainly branch approach to management and strengthening responsibility and expanding authority of republic and local soviet agencies over the condition and utilization of the natural resource potential. Actually, it is necessary to develop centralized systems of control (monitoring), norm-setting and accounting for the condition of natural resources in the environment and create an integrated system of state and public expert evaluation in the sphere of the utilization of nature.

A most important task is to improve the system and methodology for planning protection and efficient utilization of natural resources. The main thing here is orientation toward the final socioecological results and more complete utilization of the achievements of scientific and technical progress in order to implement the policy of resource-saving--the major factor in improving the utilization of nature. It is necessary to accelerate the development of the long-term state program for protection of the environment and efficient utilization of natural resources in the USSR.

A radical restructuring of the economic mechanism should completely encompass the sphere of the utilization of nature as well. The development of cost-accounting in land reclamation, forestry and other branches engaged in improvement and reproduction of natural resources, and also in specialized subdivisions for the protection of nature and the environment as well as strengthening economic stimuli for economizing on resources--these are the

most important prerequisites for increasing the socioeconomic effectiveness of the utilization of nature.

The provision of methodology and methods for carrying out these tasks is a crucial sphere of economic research.

In conclusion allow me to thank all participants in the round table meeting--both those present and those participating through correspondence--for their activity in the discussions, and I wish everyone health and more creative meetings!

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## WAYS TO RAISE AGRICULTURAL LABOR PRODUCTIVITY

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[Article by A. Okhapkin, institute director, doctor of economic sciences, and V. Orlov, VNIETUSKh sector chief, candidate of economic sciences: "Raising Labor Productivity -- A Most Important Trend for Accelerating Socio-Economic Development"]

[Text] During each stage in the development of the socialist economy on the whole and agriculture as one of the most important branches of the national economic complex in particular, typical features and key tasks which serve to define the chief trends and rates for this development may be distinguished. One feature of the modern stage is the requirement for sharply raising the efficiency of social production and particularly the need for accelerating the rates of growth for labor productivity.

In the Basic Directions for the Economic and Social Development of the USSR During the 1986-1990 Period and for the Period Up To the Year 2000, an increase by a factor of 2.3-2.5 is called for in labor productivity in the public sector of the national economy by the year 2000. The task has been established of achieving a twofold or threefold in the average annual rates for raising labor productivity and this must promote a reduction of not less than one third in overall labor-intensiveness.

The accelerated logistical re-equipping of agriculture on the whole is characterized by a substantial increase in labor productivity. On the average, during the 1981-1985 period, gross output production per average annual at kolkhozes, sovkhoses or inter-farm enterprises amounted to 193 percent of the average level during the 7th Five-Year Plan, with the average rate of growth over a period of 20 years being 3.4 percent.

Over the course of a 20 year period, labor productivity at kolkhozes increased at a higher rate than that at sovkhoses and this promoted a drawing together of its absolute values by farm categories. Typically, the entire increase in labor productivity for sovkhoses was achieved by means of an increase in hourly earnings, that is, through the intensive method, and for kolkhozes -- to a certain degree by means of an increase in the number of working days annually, per worker engaged in social production.



In particular, labor productivity has increased substantially -- by a factor of 2.7-3.3 -- in the Azerbaijan SSR, Belorussian SSR and in the Baltic republics. Moreover, considerable rates of growth were achieved in the Latvian and Estonian SSR's against a high initial level and today the production volumes for gross agricultural output per average annual worker exceed the average union indicator here by factors of 1.6 and 2.4 respectively. At the same time, the rates of growth for labor productivity were very low in a number of regions throughout the country. For example, in the Tajik, Turkmen, Kazakh, Uzbek and Kirghiz SSR's, the average annual increases turned out to be less by a factor of 2-3 than the average union increases.

In discussing the unconditional positive achievements realized in raising the productivity of agricultural labor, mention must also be made of the fact that the dynamics of this process are not in keeping with the modern national economic requirements and that it is characterized by a number of negative tendencies. Over the past 4 five-year plans, the rates of growth for labor productivity in public agricultural production have been considerably lower than in other branches of the national economy. The most negative trend is the stable tendency towards a reduction in the rates of growth in labor productivity in the agricultural branch, with a systematic increase taking place in capital and energy supply for production, in the capital-labor and power-worker ratios and in the level of production mechanization. The average annual increases in it declined from 5.4 percent during the 8th Five-Year Plan to 4 percent during the ninth, to 2.6 during the tenth and to 1.5 percent during the 11th Five-Year Plan, or only one third of the increase planned. Moreover, there was no increase in labor productivity whatsoever in the Tajik and Uzbek SSR's during the 11th Five-Year Plan and there has been none in the Kazakh, Kirghiz or Turkmen SSR's since the 9th Five-Year Plan.

A similar situation is being observed within regions. For example let us take the Russian Federation. Here, at kolkhozes and sovkhoses in Vologda, Leningrad and Sakhalin oblasts and in the Karelian ASSR, over the course of the last three five-year plans, the average annual increases in labor productivity amounted to 4.8-5.8 percent, in Moscow, Kirov and Sverdlov oblasts and in Krasnoyarsk and Khabarovsk krais -- 3.9-4.5 percent and in Vologda, Kurgan, Orenburg, Chita and Amur Oblasts and in the Checheno-Ingush ASSR -- 0.6-1.6 percent; for all practical purposes, labor productivity in Tambov Oblast has not increased since the early 1970's and in the Tuva ASSR -- no increase over the past 4 five-year plans.

In the case of individual agricultural branches, accelerated logistical re-equipping exerted the greatest effect, especially during the initial period, in connection with raising labor productivity in the grain economy, beet production and swine and poultry raising. During the 1966-1975 period, direct labor expenditures per unit of product at kolkhozes and sovkhoses declined: in the grain economy, it declined by factors of 2.6 and 1.8 respectively, in beet production -- by 1.7 and 1.4, in swine raising -- by 1.6 and 1.5, in poultry raising -- by factors of 2.4 and 2.6 respectively; at kolkhozes, labor intensiveness in the production of vegetables outdoors and also potatoes and

milk declined by a factor of 1.5-1.7. Labor expenditures per unit of product in cotton production and sheep raising showed only a negligible decline -- 11-15 percent.

During the years under study, the comparatively high rates of growth for labor productivity in the field crop husbandry branches were conditioned by improved cropping power for the agricultural crops, which affected the overall output volume by types, and by a reduction, although limited, in labor expenditures per unit of crop areas, as a result of an increase in the mechanization level for the principal production processes and quality improvements in the technical equipment. During the 8th and 9th five-year plans, the grain crop yields increased by more than 40 percent, sugar beets -- by 32 and potatoes and vegetable grown outdoors -- by 18-20 percent. At the same time, the average annual milk yield per cow increased by more than 18 percent. The greatest increase in the mechanization level for harvesting cotton and potatoes and for carrying out loading work and labor-intensive operations in animal husbandry occurred during this period.

During the 10th Five-Year Plan, a trend was observed towards a slow-down in the rates for a reduction in labor-intensiveness for a majority of the field crop husbandry and animal husbandry products. During this five-year period, compared to the previous one, a substantial increase took place in labor productivity at sovkhoses in the poultry production branch (by 75 percent) and at kolkhoses -- in grain production and outdoor vegetable production (by 28 and 35 percent respectively).

During the 11th Five-Year Plan, as a result of especially complicated weather conditions, which had a direct effect on the productivity of the agricultural crops and an indirect effect on the level of livestock productivity, a substantial increase in labor productivity at sovkhoses was noted only in the poultry production branch and at kolkhoses -- in beet production. In the remaining branches of agricultural production, the average annual labor expenditures per unit of output declined either negligibly (by 3-7 percent) or they increased. For example, on the average they increased by 26 percent at sovkhoses in cotton production and in sheep raising -- by 3-6 percent, compared to these expenses during the 10th Five-Year Plan.

An analysis of data which describes the dynamics of labor productivity in some agricultural branches allows one to draw the conclusion that commencing with the second half of the 1970's, despite the build-up in the logistical base, a decisive role in the formation of specific labor intensiveness for a majority of the types of agricultural products began to be played by an unregulated and essentially random factor -- the weather conditions of individual years -- while the role played by production factors -- technical, technological and organizational -- became extremely minimal in nature.

In the face of an overall trend towards bringing together the absolute levels for labor productivity on the whole and the labor intensiveness of individual types of products, by categories of farms, unjustifiably high differences continue in a number of instances: in swine husbandry -- by twofold and in poultry raising -- by a factor of six. As a result, in 1985, at kolkhoses of Gosagroprom [State Agro-industrial Committee] for the RSFSR on the whole, the

increase in live weight in hogs amounted to 52 percent of its level at sovkhoses in the system and labor expenditures -- 146 percent. This means that 200 million man-hours of direct or 330 million man-hours of general labor expenditures were spent in excess for the actual volume of goods produced and this is equivalent to the attraction into the branch of approximately 180,000 additional average annual workers. Twelve percent of all labor expenditures were spent for the production of 1.3 percent of the overall quantity of eggs.

One serious problem continues to be that of forming the labor productivity level in the principal branches of agricultural production by regions of the country. The differences in the amount of labor expenditures per unit of output by regions clearly exceeds the economically sound limits and this is caused both by the existing distribution of production and by organizational-technical and organizational-technological factors.

Even in the case of large regions, there is a difference in the specific labor intensiveness with which the amount of overall production expenditures is correlated: in sugar beet production -- by a factor of four, potatoes -- 7-10, milk -- 3-5 and pork -- a factor of 6-9. Typically, these differences are great even in neighboring regions having similar, and for the production of a number of types of products, immaterial differences in natural conditions. In 1985, at sovkhoses in the Ukrainian, Belorussian and Latvian SSR's, the direct labor expenditures for the production of 1 quintal of industrial sugar beets amounted to 0.7, 2.2 and 1 man-hour respectively, for 1 quintal of milk -- 7, 8 and 5 man-hours and in the Estonian SSR -- 3 man-hours. During the 1981-1984 period, the average labor expenditures for 1 quintal of potatoes in the Russian Federation were as follows: in Smolensk and Kaluga oblasts -- 1.3 and 3.4 man-hours respectively, in Lipetsk and Belgorod oblasts -- 2.3 and 5.4, in Stavropol Kray and Rostov Oblast -- 2.5 and 7.9 man-hours and so forth. The differentiation of indicators for specific labor intensiveness is still higher for some farms at the intra-oblast and even intra-rayon levels. It bears mentioning that such differences in labor productivity correspond to a temporary interruption of 20-30 years.

Thus an analysis of the rates for logistical re-equipping of agricultural production and the rates of growth for labor productivity in this branch underscore their clear incompatibility. Over the past 20 years, for a 1 percent increase in capital-labor ratio, power worker ratio and energy supply, there was an average increase in labor productivity of 0.24, 0.31 and 0.37 percent respectively and in a number of regions these indicators amounted to only 0.13-0.17 percent. As a result, the following developments were noted: a stable reduction in the output-capital ratio, growth in the material-monetary expenditures per unit of output, a disruption in the ratios required for expanded reproduction in the rates for growth in productivity and wages and a deterioration in the availability of labor for public agricultural production. The latter circumstance is of special economic and social importance.

An aggravation of the labor balance in the agricultural branch, from the standpoint of both quantity and quality, is being manifested in a systematic increase in the annual employment of workers and kolkhoz members in public production (in many regions and involving large professional groups of workers

-- over and above the legislative norms, with a corresponding disruption in the regimes for work and recreation) and in a stable expansion of the scales for the use of workers attracted to kolkhozes and sovkhoses from other branches and spheres for the application of labor.

The increasing seasonal and in many instances year-round shortage of personnel in agricultural production is definitely associated with the above-plan departure of labor resources from the rural areas as a result of a complex of socio-economic factors. Over a period of 20 years (1966-1985), the number of persons working in agriculture (not counting those drawn in from the side) decreased by 15 percent and the overall number of workers at kolkhozes and state agricultural enterprises -- by 9 percent.

The essence of the degree to which the problem of labor supply for the branch was aggravated during the period being analyzed is as follows: as a result of low rates of growth in labor productivity and the mainly extensive development of animal husbandry, the overall labor intensiveness of agricultural production, following a certain reduction during the 1960's and over the past 15 years, stabilized for the most part at the level of 41-42 billion man-hours, with a deviation of 2-3 percent owing to weather conditions during some years. In the process, a stable redistribution of labor expenditures in favor of the animal husbandry branch was observed and this explains the decisive role it will play the formation of the level and rates of growth in labor productivity for the future.: for kolkhozes and sovkhoses, an average of 63 percent and for many oblasts throughout the republic, up to 70 percent of the overall labor expenditures will be employed in animal husbandry.

The shortage in labor resources has been compensated to a certain degree by an increase in the annual employment of a worker, mainly at kolkhozes, where at the beginning of the period under review it amounted to an average of approximately 230 working days. This process developed in an active manner during the 1970's, by the end of which the annual employment of kolkhoz members, even without taking into account the considerable labor expenditures of private plots, had approached its limit, having reached an average of 257 and in 1985 269 working days per worker; the annual employment of sovkhos workers exceeded 275 working days. Thus, the branch's extensive labor reserves were for all practical purposes exhausted and even a limited withdrawal of man-power in the face of stabilization of overall labor intensiveness brought about an expansion in the attraction of workers from other oblasts and spheres for the application of labor.

For the 12th Five-Year Plan, the plans call for the average annual volume of gross agricultural output to be increased by 14.4 percent compared to its volume for the 11th Five-Year Plan and for the average annual level for labor productivity in the branch's public sector to be raised 21.4 percent during the five-year period. This means that by raising labor productivity it will become possible not only to obtain the entire increase in output production but also to lower, prior to the beginning of the 1990's, the overall labor intensiveness of the branch by not less than 6 percent, or roughly by 2.5 billion man-hours annually. Such a savings in labor expenditures is equivalent to a real reduction in man-power requirements of 1.4 million average annual workers annually, required for normalizing annual employment

and the regimes for work and recreation for personnel and for reducing the extent to which man-power is drawn in from other branches. The persistent need for raising labor productivity considerably and for overcoming negative tendencies requires the uncovering of priority trends for raising the effectiveness of use of the production potential already created, in the interest of lowering the specific and overall labor intensiveness of agricultural production and achieving all-round utilization of the reserves available for realizing economies in the use of labor.

The level and trends associated with changes in labor productivity and overall labor intensiveness in agricultural production are formed under the influence of a complex of mutually associated and interrelated factors, the hierarchy of which, from both a temporary and regional or intra-regional standpoint, is by no means simple. At the same time, there are undoubtedly overall factors and conditions concerned with realizing economies in the use of labor.

High and stable rates of growth for labor productivity in agriculture are achieved under two conditions -- a systematic increase in the agricultural crop yields and in livestock productivity and a reduction in labor expenditures for each hectare cultivated and for each head of livestock and poultry. Owing to the specific nature of agricultural production, labor expenditures per unit of land area and per head of livestock are considered to be either relatively constant or variable. The former, employed for the carrying out of mandatory operations, affect future volumes for the production of goods not so much in terms of the amount of labor, but rather its quality and timely application. The latter are associated to a considerable degree and in a number of instances (especially in the case of a low level of mechanized labor) almost proportionately to the agricultural crop yields and to the livestock productivity.

Of considerable importance is the fact that a portion of the products planned for production in field crop husbandry must be "advanced" in the form of seed (past agricultural labor). Thus it is obvious that the level of labor productivity will depend substantially upon the degree to which the product obtained per unit of space, that is, productivity, exceeds the "advanced" portion. In animal husbandry, a similar portion of past labor in the form of feed and live labor for providing services is used for sustaining the lives of the livestock and poultry. Hence a need arises for ensuring minimal and economically sound (for various production conditions) levels for crop yields and livestock productivity, which will justify the socially needed labor expenditures and the priority trends for raising labor productivity, depending upon the yield and productivity levels achieved, labor expenditures per unit of space and the number of animals in each specific instance, assuming their complete utilization.

With definite achievements being realized in raising the productivity of fields and farms, the modern absolute level for such productivity and its tendency towards change in terms of a number of important types of products are not in keeping with the requirements for intensive production. The potato production branch can serve as a typical example, where for kolkhozes and sovkhoses throughout the country as a whole the average annual direct labor expenditures amount to approximately 800 million and the overall expenditures



amount to 1.2 billion man-hours. Over the course of four five-year plans, the average potato yield at all categories of farms did not exceed 113-117 quintals per hectare, with a lower level being observed in the public sector and considerable differentiation by regions and at the intra-farm level.

Thus, for 12 large regions of the Russian Federation representing an overall potato crop area of 200,000 hectares, according to data furnished in kolkhoz and sovkhoz reports for 1981-1984, the average annual yield for this crop was lower than 60 quintals per hectare and for a number of oblasts it was even lower: Voronezh and Kursk -- 49, Belgorod and Saratov -- 36 and Rostov -- 30 quintals per hectare. This indicates that even with the expenditure of planting stock, sub-grade tubers and waste scraps from the processing and storage of marketable potatoes being taken into account, seed used for planting for all practical purposes is not being produced and quite often it is not being reproduced and hence the annual expenditures of live labor (roughly 70 million man-hours) and monetary-material resources (more than 300 million rubles) turn out to be pointless. The analysis of data for dairy and potato oriented sovkhozes in Moscow Oblast over a period of a number of years reveals that a reduction in labor expenditures for the production of 1 quintal of potatoes to 2 man-hours and a reduction in the production cost for 1 quintal to 12-14 rubles are possible with a minimal yield level for this crop -- 130-140 quintals per hectare.

For example, let us take beet production. According to report data furnished by kolkhozes and sovkhozes, approximately 150 farms in Orel Oblast, 60 in Voronezh and 100 farms in Tambov Oblast are obtaining less than 75 quintals of industrial sugar beets per hectare and quite often the yields for food roots and silage crops do not exceed 70-100 and grain crops -- 6-7 quintals per hectare.

During the 1981-1984 period, the average daily increases in live weight in cattle during raising and fattening on farms in the Checheno-Ingush ASSR amounted to 199 grams and in the Dagestan and Kabardino-Balkar ASSR's and in Orel, Ryazan and Kaluga oblasts -- 230-290 grams. A similar picture prevails in swine husbandry: on farms in Kursk, Orel and Tambov oblasts and in the Mordovian ASSR, the average daily increases in live weight in hogs over a period of a number of years did not exceed 147-180 grams. All of this serves to indicate that in order to achieve a delivery weight of 350-400 kilograms in young cattle stock and 100 kilograms in hogs, such animals must be maintained (with daily expenditures of labor for servicing) approximately 3.5-4 years and 12-26 months respectively and these figures exceed the normative periods by a factor of 2-3.

It is obvious that many years of "peaceful coexistence" of farm formations with an economically sound (particularly from the standpoint of labor intensiveness) level for the primary indicators of production efficiency -- yields and productivity -- must not lie in the future. At the present time, no methodological complications appear to be involved in the development for each region of basic parameters for the production of goods, the yield for each level of which must serve as a signal for the adoption of basic measures aimed at improving production specialization, achieving a balance between the output volumes planned and the real resources and improving use of the latter.

In achieving high and stable rates for raising labor productivity, an increase in the technical machine-worker ratio traditionally plays a leading role. Even with the achievements mentioned in this regard, there are still unsolved problems awaiting solutions in this area.

An analysis of data for kolkhozes and sovkhoses in the RSFSR on the overall labor intensiveness of agricultural production over the past 15 years has shown that even with a systematic increase in technical potential and the level of mechanization and a one third reduction in the number of workers and kolkhoz members engaged in horse-assisted and manual operations, the actual overall labor expenditures by this category of workers declined negligibly -- by less than 11 percent. In other words, technical progress is still having only a limited effect on reducing the amount of low productivity manual labor. Here one sees the effect of a complex of factors which have been studied to varying degrees and evaluated differently in administrative practice.

A shortage of efficient types of mechanization equipment has definitely had an effect -- various types of loaders, feed harvesting machines, hay stackers and sweep rakes and combines, with the situation being made worse by shortcomings in the system for distributing technical equipment among regions and within them -- among individual farms. Thus, for 1,000 hectares of potato plantings at kolkhozes and sovkhoses in Bryansk, Ivanovo and Moscow oblasts, there are 38-43 potato harvesting combines and 11-12 potato sorting stations, or more units than are required in accordance with the norms. On the other hand, on farms in the Chuvash and Bashkir ASSR's and in Voronezh, Tambov and Penza oblasts, there are only 5-7 such combines and 2-4 stations. In many regions of the country, the mechanization level for labor intensive processes in animal husbandry is low. Prior to the end of the 11th Five-Year Plan, from 8 to 40 percent of the cows on farms in the Yakut, Tuva and Dagestan ASSR's and in Chita, Irkutsk and Kalinin oblasts were located at completely mechanized farms; from 17 to 36 percent of the overall number of young cattle stock -- on farms in the Dagestan and Udmurt ASSR's and in Kalinin, Kaluga and Kostroma oblasts; from 19 to 33 percent of the hogs -- in Arkhangelsk and Kaluga oblasts and in the Checheno-Ingush ASSR. It must be mentioned in this regard that not enough attention is being given within the system for the planning and delivery of agricultural equipment to the true production conditions and particularly to the level of production concentration and to the peculiarities of land utilization in some regions.

According to the materials obtained from a technical inventory of animal husbandry farms carried out in 1982, approximately 14 percent of the overall number of cows throughout the nonchernozem zone of the RSFSR as a whole are being maintained at relatively small farms -- a capacity of up to 100 head and in such oblasts as Kirov (19 percent of the cows), Ivanovo (27 percent), Pskov (32 percent) and Novgorod (more than 40 percent) -- in cow barns with capacities of 65, 73, 82 and 87 head respectively. There are approximately 20,000 such installations throughout the country as a whole and they will be used for some time into the future. The equipment being produced by industry for the mechanization of production processes is oriented mainly towards cow barns capable of holding 200 or more head.

According to statistical data for 1985, of the overall number of farms having hogs, there were no more than 500 head at each of 42 percent of the kolkhozes and 53 percent of the sovkhoses and this means that the size of the brood herd was 30-50 and the number of suckling pigs, replacement animals and young stock undergoing fattening regimes -- 150-200 head respectively. Generally speaking, there are no sets of equipment in production for farms having such animals, nor are there individual items of light mechanization equipment available. A paradoxical situation is being created: one million animals are being serviced manually, while thousands of units of uninstalled feed distributors, conveyers for the removal of manure and milking units lie idle.

The tremendous scales of agricultural production throughout the country have created a situation wherein even with a comparatively high level of mechanization for the principal production processes (up to 90-95 percent), extremely large volumes of manual work continue to be carried out in field crop husbandry. During the 11th Five-Year Plan, at kolkhozes and sovkhoses in the RSFSR alone, the cutting down of all types of plants for hay and green feed was carried out manually each year on an area of approximately 2.5 million hectares, the cocking of hay -- on 3.5 million hectares, the stacking and ricking of hay and straw -- on almost 8 million hectares and the removal and loading of silage -- in a volume of 18 million tons.

Interestingly enough, over the past 15 years, with the availability of electric power and the power-worker ratio increasing by a factor of 2.2-2.4, the level of mechanization of a number of labor intensive operations, especially the procurement of feed, increased only slowly. Moreover, on considerable areas of unsuitable land and on land having light contours, where the use of powerful modern equipment is difficult or impossible, feed procurement work is generally not carried out, even when there is insufficient feed for the livestock, owing to a shortage of man-power. For decades, the problem concerned with supplying the farms with miniature equipment has for all practical purposes not gone beyond the discussion stage. Meanwhile, the normative expenditures of low productivity and heavy manual labor for the above-mentioned types of work, which with use of the appropriate machines and mechanisms could be reduced by a factor of 8-10, still amount to almost 2 billion man-hours annually at kolkhozes and sovkhoses throughout the country and this figure is equivalent to the year round employment of more than 1 million workers.

Labor productivity is adversely affected both by considerable amounts of equipment and machine idle time, caused by technical defects (according to photographic and time-keeping observations from normative research stations, from 1 hour per shift for the sowing of grain crops and the procurement of feed to 1.5-2.5 hours for the combine harvesting of potatoes and grain crops), and by shortfalls in output owing to losses and the dragging out of field work operating schedules.

However, an adequate quantity of modern items of technical equipment is considered to be merely a prerequisite for accelerating growth in labor productivity. At the present time, the basic cause of the maintenance of a high absolute level and low rates for lowering specific and technological

labor intensiveness in agricultural production is the lack of coordination in the use of technical, technological and organizational factors for raising labor efficiency. The efficient use of new and potentially high productivity equipment requires the use of a leading machine technology and appropriate forms and methods for organizing production and labor. The failure to observe these objective requirements, particularly a conversion over to the new technical conditions for a backward technology and obsolete forms for organizing labor, brings about a negligible reduction in the schedules for carrying out seasonal work and a reduction in the labor intensiveness of production, with a substantial deterioration taking place in the indicators for output-capital ratio, production costs and production profitability.

For example, a threefold renovation (from the standpoint of quality) of the pool of grain harvesting combines (successively from C-6 to CK-6) since the beginning of the 1960's, with an increase in their number by a factor of 1.5, had a limiting effect on a reduction in the schedules and labor intensiveness of the harvest work, since the daily output per combine during this period did not increase either in terms of area harvested or in grain yield, amounting to 7-8 hectares and 100-120 quintals respectively, figures which were inferior to those recorded by leading elements by factors of 2-3 and 4-6. In recent years, workers attached to harvesting-transport complexes, detachments and groups and also family collectives, in practically all regions, have been harvesting grain crops from an area of 15-20 hectares or more on a daily basis and they have been obtaining up to 1,000 quintals per combine.

In the dairy cattle husbandry operations of kolkhozes and sovkhoses in the RSFSR, prior to the end of the 11th Five-Year Plan, with the level of mechanization for the milking of cows at 96 percent, the level of all-round mechanization at 71 percent and one milkmaid servicing an average of 22 cows (in Leningrad, Moscow and Omsk oblasts -- 27-32 cows), owing to imperfections in the division of labor and in labor cooperation in carrying out the principal and auxiliary operations, in retaining the system of individual servicing of animals and the three-cycle regime for working time and also a shortage of skilled personnel, one principal worker in the branch serviced roughly 10, and taking into account the indirect labor expenditures -- six cows, or just slightly more than would be the case under non-mechanized production conditions. Many years of experience underscore the futility of attempting to raise livestock productivity, or even maintain it at the level already achieved, through individual servicing of the animals, in the face of a considerable imbalance in the animals and in real feed resources.

The mastering of the flow line-shop system of milk production ensures an increase of 25-30 percent in labor productivity, which is comparable to its overall growth throughout the branch over the past 15 years. Based upon four technological systems employed in four shops -- dry cows, calving, increasing milk yields and artificial insemination, milk production -- the new system makes it possible to establish group norms for the feeding of livestock and it promotes the streamlining of processes, specialization and cooperation among workers, improved utilization of the milking and other types of equipment and a conversion over to use of the collective contract.

However, despite the 10 years of positive experience already accumulated, the flow line-shop system of milk production is still not being employed extensively: two thirds of the farms are still organizing their production operations based upon old methods. It is our opinion that this is the result of imperfections in the system for the planning, accounting and control over labor productivity and labor intensiveness in agricultural production as a whole and in the dissemination of labor-conserving technologies in particular. In addition, it also has to do with insufficient material interest and responsibility being displayed by farm leaders and specialists and APK [Agro-industrial Complex] organs of administration at all levels in realizing economies in the use of labor. It must be pointed out that despite the adequately developed system of normative support for the carrying out of individual types of agricultural work and the servicing of adult groups of livestock by the principal workers, there is for all practical purposes an absence of sound norms for the technological labor intensiveness of output production, which are differentiated taking into account the differences in the technical equipping of individual farms.

Under conditions involving accelerated logistical re-equipping of the branch, the effectiveness of agricultural production and particularly the level and rates of growth for labor productivity are dependent to a greater degree upon improving the personnel professional-skill structure and upon the differentiated development of both specialization and the general purpose nature of labor, with the use of new and more improved equipment and progressive technologies being taken into account. This imposes special requirements on the organization of personnel training, on their systematic retraining and on improving their skills.

The essence of the problem concerned with improving the man-power structure in agriculture from the standpoint of quality, in view of the tremendous scale of annual professional training for new workers, consists of ensuring that its structure does not conform to the actual manpower structure at kolkhozes and sovkhozes and the future requirements for skilled personnel. In the personnel training program, the modern requirements for efficient organization of labor and production are being taken into account to only a weak degree; the least effective forms predominate in the system for retraining and for improving personnel skills. Difficulties are being experienced in retaining newly trained workers on the farms. All of these factors are holding back improvements in the overall situation.

The systems of state professional-technical education and course instruction are oriented towards expanding the scales for the training of mainly machine operator personnel. Although certainly important, it is by no means the only or even the largest professional group of agricultural workers. In recent years, for every 1,000 actual workers in the respective profession, the annual training has been as follows: tractor operators -- approximately 280, drivers -- 170, masters of machine milking -- less than 50 individuals on the average and for a number of regions -- only 13-25, a figure which is inadequate even for the staffing of newly built complexes. For a number of professional groups of livestock breeders and horse and manual labor workers, professional training is still being provided in minimal amounts.



In the face of very large scales of instruction (according to data supplied by the USSR TsSU [Central Statistical Administration], one fifth of all of the branch's workers are improving their skills annually), the proportion of the more effective forms for retraining and for improving skills is negligible: less than 8 percent of the workers are attending production-technical courses, 3.5 percent -- special purpose courses and 4 percent -- schools for leading experience. With regard to the principal training group -- machine operators -- the program for their instruction is oriented towards acquiring broad knowledge on equipment operation and repair and a limited study of the agro-technical, technological, organizational and economic problems, since this knowledge is of special importance in connection with the work of production collectives of kolkhozes and sovkhoses under cost accounting conditions.

Slow improvements in the professional-skill structure for personnel, from the standpoint of both quantity and quality and in combination with other organizational-economic factors, constitute one important reason for the inadequate effectiveness of logistical re-equipping of the branch. This is manifested in stabilization of the daily output per tractor and combine, with systematic improvements taking place in their quality structure and planned productivity, which accounts for the slow optimization of the agro-technical periods for carrying out work in farming; a limited increase in the norms for the servicing of livestock, with growth in the mechanization level for production processes in animal husbandry; slow spread of shift work, continuation of the problem of replacement personnel for uninterrupted production operations, even in regions having a surplus amount of unskilled manpower.

A distinctive feature of the modern stage in production intensification and in raising labor productivity, distinct from the previous one when productivity increased mainly as a result of additional capital investments, is the increasing importance of the psychological and moral qualities of man. This requires the use of new administrative methods that take into account the human factor and to the same degree as the technical and material factors. The human factor is understood to mean the talents, knowledge and skills of man that provide the foundation for his productive ability.

Hence a need exists for a detailed study of and an experimental check upon the use in administrative work of approved solutions which bring about a positive or negative attitude towards labor; the influence of a collective on a personality; the effectiveness of managerial forms and methods; improvements in working and recreation conditions and the organization of leisure activities. Taking into account the peculiarities of the rural areas and agricultural enterprises in connection with the mentioned branch factors, it is proper to add: an expansion in the sphere of application of skilled female labor; improvements in domestic conditions and all types of services; pre-school training and school education for children; the combining of public and private farms.

The role of the human factor in raising the efficiency of agricultural production is strengthened by the specific peculiarities of work in this branch, the theory of which is known but which has not been taken into account

adequately in administrative activity at various organizational levels. Included among the more important peculiarities are:

-- the retention to a considerable degree of the universal character of labor, conditioned by numerous operations concerned with the cultivation of agricultural crops, the servicing of animals and appropriate use of the means of labor. A division of labor by operations, one that is close to machine or conveyor type of production has been introduced only at agricultural enterprises of the industrial type where there is a high level of production concentration and worker specialization;

-- compared to industry, a more direct link between a worker and the final production results, with limited opportunities for or effectiveness of control over intermediate operations;

-- a special character for the objects of labor, which are biological objects, land, seed, plants and animals, with their own individual characteristics;

-- the need for constantly (by periods, daily and even hourly) taking into account the specific weather conditions affecting the status of objects, resources and implements of labor and also the production technology;

-- the spatial characteristics of the working area.

All of this is conditioned by the impossibility or negative consequences of centralized and strongly controlled solutions for a broad range of problems concerned with agricultural activity, including:

-- production technology, that is, a list, a sequence of operations and a method for carrying them out, while taking into account a specific branch factor -- the time for fulfillment (the optimum schedules for carrying out field operations during contiguous years can deviate by 2-3 weeks and can differ even on neighboring tracts owing to soil peculiarities or the microrelief; the number of inter-row soil cultivations or herbicide treatments for the crops is dependent upon the specific conditions and the quality and effectiveness of the previous cultivation; the selection of working organs, for example for inter-row cultivations, is dependent upon the degree of weediness, the type of weeds and the soil moisture content); -- labor organization and particularly operational organization: even the widely used morning, for the current day, plan-order, is for the most part probable in nature owing to the considerable effect generated by changing meteorological conditions (precipitation, the presence of dew or fog and the force and direction of the wind determine the real possibility of carrying out planned operations).

Hence an objective need has developed for presenting agricultural workers -- depending upon the specific conditions for some workers or their collectives which may differ in terms of size -- greater independence in the selection and implementation of both general and operational decisions. Under modern conditions, this requirement is realized most successfully when use is made of the collective contract on a cost accounting basis.

Scientific-production experiments conducted during various stages in the formation and development of the collective contract and broad production experience underscore the fact that the use of this form for organization and wages promotes a substantial increase in crop yields and in livestock productivity, in labor productivity and in increasing the yield of products per unit of land area and logistical resources. This is achieved as a result of developing among workers a sense of being master of their land, strengthening labor and technological discipline, raising mutual assistance, mutual exactingness and creative initiative and active participation by workers in administrative work. Such changes in the attitude towards work are conditioned by a strengthening of the link between the level of payments for work and the output produced, reorientation of worker interests with the final results of their activities and the creation of appropriate organizational-technical, socio-economic and socio-psychological conditions for the realization of collective material interest.

In 1985, in the field crop husbandry operations of RSFSR kolkhozes and sovkhoses, there were almost 60,000 contractual collectives consisting of approximately 1.2 million individuals, with 83 million hectares of arable land assigned to their care; in animal husbandry -- 95,000 contractual collectives numbering 800,000 individuals. According to accounting data, the indicators for the production of gross agricultural output, per man-hour and using the new form for the organization and material stimulation of labor, exceeded by twofold the indicators for collectives operating under the traditional conditions.

The further spread of the collective contract and an increase in its influence over a general increase in production efficiency and an acceleration in the rates of growth for labor productivity are associated with overcoming the formal approach being employed for the formation and maintenance of cost accounting conditions in the work of contractual collectives, consistent optimization of their size, improvements in the intra-collective distributive relationships, while taking into account the real contribution by each worker and the spread of contractual relationships to the leaders and specialists of intra-farm subunits and farms on the whole and to the organs of APK administration.

Thus, in order to raise labor productivity, a need exists for all-round mobilization of all technical, organizational, economic and social factors and the utilization of all reserves available at the various organizational levels -- inter-branch and branch, at the level of economic formations, intra-farm subunits and at each working position.

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## LABOR

### EMPLOYMENT PROBLEMS IN AZERBAIJAN SURVEYED

PM010905 [Editorial Report] Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 25 March 1987 carries on page 2 under the rubric "Azerbaijan: Cadre Problems of a Region with Surplus Manpower" and the headline "Old Residents" a 2,200-word article by special correspondents V. Andriyanov and D. Melikov on the social and economic problems of Baku. The first in a series of articles on the Azerbaijan capital, it begins by asking these questions: "Do we and our children really not need the simple truths and moral values held dear over generations? Why are they gradually vanishing from life in the city? Why have an easy life and easy money been acquiring ever greater value in people's consciousness, while oil-fields and plant shops have become deserted? Why do people today more frequently respect not those who know how to work honestly but those who know how to live?"

Going on to deal with problems in the oil industry, the article points out that "young people shun a trade which, quite frankly, has been bypassed by scientific and technical progress." "There is tremendous cadre turnover. In oilfields and in plants masters are being replaced by immigrants from rural regions. The process of the drain of skilled cadres is characteristic of all Baku industry. This is an alarming process. Many complex problems of the city are reflected and interwoven in it: the high concentration of industrial production, uncomprehensive development, laggardness in the social sphere."

The article cites F. Musayev, first secretary of Baku party gorkom, as saying: "The city's problems have become particularly acute in recent years. Up to 10,000 people have been moving into Baku every year. Economic planners have hired them in the hardest sectors, into which city people have no longer been going. Plant collectives have been almost completely renewed in a short time. Many newcomers to the city who have settled in Baku without becoming oilmen or machine builders have moved into trade and consumer services and filled the streets, markets, and stations with stalls. Plants have taken on all outsiders--not disinterestedly, presumably--while, at the same time, during the last 5-year plan they refused to take on almost 7,000 graduates of Baku vocational and technical schools. These were forced to find work outside their specialty."

"The recruitment of additional manpower from outside was based on the interests of the city economy. However, this flawed practice has damaged the economy of the republic's capital, and the consequences are being felt now. The continuous cadre turnover has sharply affected standards in labor collectives. Many leaders, having a practically unlimited source of labor resources at their disposal, have been totally unconcerned about modernizing production. The results of this policy are bitter: technical and technological backwardness in many enterprises, a rise in manual labor to 40 percent, and a fall in labor productivity growth rates."

The article points out that, "according to official data, approximately 250,000 people, of whom more than one-fourth live in Baku, are not now employed in social production in the republic." And it continues: "Baku party gorkom and gorispolkom reached the conclusion that social processes could no longer be allowed to drift but must be controlled. For this it was necessary, above all, to investigate the huge mass of problems that had accumulated in the city, including the elderly housing stock and the shortage of kindergartens, creches, hospitals, stores, movie theaters, bathhouses, laundries, and hotels. City transport was congested. The ecological situation had become complex. The exacerbation of the city's social problems demanded urgent measures and help from union ministries and departments."

Measures were taken, with the result that "last year cadre turnover fell by a factor of almost 2, and in certain enterprises by a factor of 3, compared with the average annual indicators of the last 5-year plan, and labor productivity growth rates increased." In addition, "three-fourths of Baku enterprises secured an increase in production volumes without increasing the number of workers, thus essentially debunking the myth of the need for an influx of manpower from outside."

It was estimated that "7,500 young, healthy men could be released from the trade and consumer services sphere in Baku and be replaced by girls and women," thus freeing the men for other work. However, the "stall kings" were in no hurry to leave their profitable stands. "But the party gorkom and gorispolkom displayed persistence, tact, and the ability to approach people, and more than 4,000 men switched to the production sphere."

Moscow SOTSIALISTICHESKAYA INDUSTRIYA 26 March carries on page 2 the 1,800-word second article in the series, entitled "Limitchiki" (a reference to people granted temporary permission to reside in a city). This describes how Baku factories take on workers from rural areas without providing them with accommodation, with the result that people are forced to "rent corners and tiny rooms or put up shanties." "Crowds of recruited workers have surged into the city, and the outskirts and waste land have been filled with home-made shacks that have grown up overnight." The article maintains that, "according to gorispolkom data, approximately 200,000 people live" in these huts, which "an authoritative commission has classed as unfit for habitation."



The article continues: "The unplanned, spontaneous emergence of a 'second' Baku has exacerbated many problems of the big city. A lot of these already existed, because enterprises--the majority of them belonging to union and union republic ministries--were built without developing the social infrastructure." While boasting of Azerbaijan's great strides in developing industrial production, the leaders "pushed into the background concern for improving working and living conditions and satisfying the interests and needs of workers and their families." Unfortunately, the unskilled new recruits are "undemanding, consent to anything," and are easily replaceable, with the result that leaders are loath to introduce mechanization and better conditions. The writers state that "a mechanism slowing down the city's socioeconomic development has, in point of fact, been openly operating."

SOTSIALISTICHESKAYA INDUSTRIYA for 27 March carries on page 2 the 1,800-word third article in the series, entitled "Private Traders." This describes a visit to Kubinka, a Baku shantytown where "almost 10,000 people live, more than 6,000 of them children and teenagers," who engage in selling beer, liquor, vegetables, and home-baked foodstuffs at inflated prices.

The article notes that "approximately one-fifth of all the city's labor resources work at home or on subsidiary plots." In addition to mothers of young children, this group includes "free labor resources--approximately 60,000 people, of whom 49,000 are women. On what do they live? A large number of them live off relatives and friends, others work 'in the private sector, for hire,' grow flowers, greens, vegetables, and some are spongers."

The article continues: "Almost one-third of the persons charged with criminal offenses in Baku come from those who do not work. This is literally a breeding ground for crime. Things will certainly become calmer in the city if work is found for 'free labor resources,' and as soon as possible. We do not want to dramatize the situation, but many tragedies would have been prevented if there were not so many people in Baku with nothing to do. In Ordzhonikidzevskiy Rayon Prosecutor's Office we were told of a case that had just ended: Two unemployed girls strangled a juvenile acquaintance. They needed money. He did not have much money. They took his books."

This part in the series of articles concludes as follows: "Last year, in all, 2,000 people leading a parasitic way of life were brought to light in Baku. Half of them were found jobs, while criminal proceedings were instituted against hardened spongers. Sales of liquor have decreased by a factor of 3.5. The situation in the city is gradually being cleaned up. But it is early, too early, to rest content."

SOTSIALISTICHESKAYA INDUSTRIYA for 28 March carries on page 2 the 1,900-word fourth article in the series, entitled "Dependents," dealing mainly with the problem of unemployed teachers in Baku. It states that "in Baku alone now approximately 8,000 teachers are not employed in teaching, and 3,600 of them are not in work at all." And it goes on: "In addition to teachers, approximately 1,500 cultural specialists and hundreds of doctors are

registered as seeking employment... Only a little over one-third of workers questioned are working in full accordance with the specialty they acquired in an educational institution. More than one-third of technical college graduates and one-fifth of all VUZ graduates are employed not in their own speciality. Many do not work at all."

The article explains how this has come about: "A paradoxical situation has been created in the Azerbaijan SSR: A whole number of subjects are in practice provided with teaching cadres through the year 2000. Nevertheless, last year the Azerbaijan Teacher Training Institute admitted approximately 2,000 students. An equal number of specialists will graduate from it this summer. What will happen to them? Will they stand in an endless line? According to Z. Koralov, Azerbaijan SSR deputy minister of education, there are now 14,000 teachers in this line." These include people who came to Baku from other parts of the republic who out of force of habit do not return to their home districts or go elsewhere in the country where teachers are needed. But the writers emphasize that these trained teachers must also think of their "duty to society."

The article goes on to criticize the habit of siting new production facilities in Baku and points out: "In the opinion of economists, it is necessary to restrict the 'entry' of industrial enterprises to the capital and develop only production facilities which complement the complex of urban industry and improve its intersectorial ties. It certainly makes sense to examine from this viewpoint proposals to site projects planned for Baku in small and middle-sized cities in the republic which have surplus labor resources. This would reduce unjustified migration."

Returning to the problem of employing specialists, the article cites F. Musayev, first secretary of Baku party gorkom, as saying: "The serious shortcomings in training and placing specialists with higher and secondary specialized education have been caused by the uncoordinated actions of planning organs and ministries and by omissions on the part of party committees. I must say that we are also alarmed at blunders in the training of worker cadres. At our suggestion the republic State Committee for Vocational and Technical Education has reconsidered the plans to admit students to vocational and technical schools in the light of the requirements of the city's economy. The situation is being rectified here. Very urgent measures must now be taken with VUZ and technical school graduates."

Pointing out that "we are talking of thousands of young people left virtually without work," the writers of the article complain that "we could not help forming the impression that comrades have reconciled themselves to the situation and taken shelter behind the usual, calm phrases about distortions in the use of labor resources." And they continue: "Let us call things by their proper names. Among those 'not employed in social production' there are many who do not have work today. Precisely this was how the question was posed at the Azerbaijan Communist Party Central Committee Plenum last July. The plenum pointed out that the organizational and ideological education work of party obkoms, gorkoms, and raykoms must be directed toward the full realization of citizens' constitutional right to work."

SOTSIALISTICHESKAYA INDUSTRIYA for 29 March carries on page 3 the 2,000-word fifth and final article in the series, entitled "Volunteers." This notes that it has been decided to release thousands of oilmen whose labor is no longer required. However, this raises the problem of where they are to go now, since "it does not make sense to swell the ranks" of "the approximately 250,000 people not employed in social production in the republic."

V.N. Konovalov, second secretary of the Azerbaijan Communist Party Central Committee, makes the following point in this connection: "We recently approved the targeted comprehensive program 'Demographic Development and the Rational Use of Labor Resources in the Azerbaijan SSR Through 1990,' which outlines broad measures to involve the unemployed section of the population in socially useful labor and to bring the growing labor resources into production. The aim is to achieve a fundamental breakthrough already in the 12th 5-Year Plan. The targeted program's implementation will make it possible to employ the entire increase in labor resources and, in addition, to bring into the public sector the mobile section of the able-bodied population which has settled into work at home and on private subsidiary plots. It is proposed, in particular, to double the inter-republican organized recruitment of workers by comparison with the original 5-year plan target and to widen the Komsomol appeal."

The writers continue: "The republic party organization regards the republic's participation in developing the West Siberian oil and gas complex and the RSFSR Non-chernozem Zone and in opening up the zone around the Baykal-amur Main Railroad as the patriotic duty of Azerbaijan working people and as a manifestation of internationalist traditions. But understanding of this lofty duty does not come of its own accord. It is asserted in a hard struggle against old views and customs. We have heard many people refer to the Azerbaijanis' devotion to home, to a character which does not allow them to go anywhere else, and to problems of resettlement.

"Of course, there is some sense in these objections. It is proposed that approximately 35,000-40,000 young people will leave the republic under organized recruitment and the Komsomol appeal. Let us note that skilled cadres are chiefly needed. And, quite obviously, men. This is how the Azerbaijanis are: The men are mobile, girls are not. Grooms will leave, brides will remain. There are already many cities and rayons in the republic where there are more women, particularly young, unmarried women, than men. And this ratio has a tendency to grow. The result is a vicious circle: One problem is solved but another created, and the population structure by sex and age is being upset. Clearly, the way out is, simultaneously with the process of displacement, to build more industrial enterprises in the republic itself, create branches, and make wider use of home working, drawing people into cooperatives, and so forth."

Describing how Azerbaijanis have successfully settled in other parts of the Soviet Union, the article notes that over 3,000 people have moved to Amur Oblast since 1982, and 80 percent of them have remained there. It suggests that the Azerbaijan mass media more actively publicize the work opportunities available elsewhere.

The article concludes as follows: "Could there be more volunteers? We reply definitely: Yes! What is hindering this? One of the chief causes is poor knowledge of Russian. Because of this fewer guys enter military schools than would like to, and fewer go elsewhere. Sometimes even someone with higher education cannot explain himself in Russian. And the reason: teacher cadres.

"When discussing the State Plan for the Azerbaijan SSR's Economic and Social Development for 1986-1990, the republic Supreme Soviet deputies spoke of the need for serious restructuring in the sphere of the rational use of labor resources. Taking into account the exceptionally great political significance of this problem, all organizations, ministries, departments, associations, and local organs must find efficient ways to ensure the able-bodied population's full employment.

"We recall the people we have met in Baku during these days--old residents, oilmen, unsettled limitchiki, people who are dependent but not out of choice, spongers... A fundamental breakthrough is needed. The aim must be set of giving everyone work by the end of the 5-year plan, if not sooner. It is necessary to select work to the liking of some, explain to others where they are more needed today, and make yet others work. All according to the principles of socialism."

This is followed by a note from the editors expressing the hope that the questions raised by the newspaper "will be examined attentively at the Azerbaijan Communist Party Central Committee and in the union and republic departments concerned, particularly the USSR and Azerbaijan SSR Gosplans and the USSR and Azerbaijan SSR State Committees for Labor and Social Problems."

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## EDUCATION

### SECONDARY EDUCATION OFFICIAL ON CURRENT SECTOR DEVELOPMENTS

Moscow SREDNEYE SPETSIALNOYE OBRAZOVANIYE in Russian No 2, Feb 87 pp 2-5

[Article by A.P. Yegorov, director of the planning department for the training of specialists with secondary specialized education, USSR Ministry of Higher and Secondary Specialized Education: "Let Us Fulfill the 5-Year Plan"]

[Text] The second year of the 5-year plan is an uncommon one--it is the year of the Great October Revolution's 70th anniversary. All Soviet people are preparing to greet this dear-to-our-hearts date with shock labor. This year has taken the baton from 1986, and that was not a bad one for the Soviet country. In implementing 27th CPSU Congress decisions, the Soviet Union's workers achieved a pronounced change for the better in the economy by persistent work. The highest growth rate in national income since the beginning of the present decade was attained--4.1 percent. Acceleration became a real force.

The state plan for the country's economic and social development and the USSR State Budget for 1987, the second year of the 12th 5-Year Plan, build upon the favorable changes achieved in the economy in the first year, and conform to the 27th CPSU Congress policy of accelerating our country's social and economic progress.

About 55 percent of the state budget is being directed into financing the national economy, and the rest is from the enterprises' and associations' own funds. The economy's development will be based upon fuller use of intensive factors, such as increasing labor productivity without increasing the number of employees, more fully utilizing existing fixed capital, reducing production's material consumption, radically improving the technical level and quality of products, and actively utilizing the achievements of scientific and technical progress.

These problems can be solved successfully, given the existence of highly skilled staffs of specialists, including those with secondary specialized education. Look at how many important changes there have been in our field.

During the now ended 11th 5-Year Plan, higher and secondary specialized schooling fulfilled the quota for training specialists established by the state plan of economic and social development for the years 1981-1985. Over 10.5 million specialists were graduated from VUZes [higher educational institutions],



tekhnikums, and specialized schools during this period, including 6.3 million with secondary specialized education. A large number of specialists in the new and promising directions of science and technology flowed into the national economy, including specialists in the fields of production and design automation and computer and robot equipment creation and operation, as well as teachers of elementary grades, instructors of preschool institutions, and medical workers.

The provision of specialists to the enterprises of industry, construction, transport and communications, agriculture, the services area, and the sectors producing consumer goods was increased. Thus, whereas there were 133 specialists with secondary education per 1,000 persons of the employed population in 1980, this index had increased to 147 in 1985. The highest concentration was in the Estonian SSR and Lithuanian SSR--161, and in the RSFSR--155.

The number of specialists increased by 15.5 percent during the years of the 11th 5-Year Plan. The greatest increase was achieved in training specialists in the fields of electronic technology, electrical instrument making and automation, the technology of food products and consumer goods, and agriculture.

For the union republics, the greatest increase in number of specialists took place in Uzbekistan (by 30 percent), Armenia (by 27.6 percent), Turkmenistan (by 28.0 percent), Lithuania (by 25.2 percent), and others; however, the increase was below the average level in a number of republics: Ukrainian SSR (14.4 percent), Estonian SSR (14.6 percent), RSFSR (13.3 percent).

As is well-known, the ratio of specialists with higher and secondary education describes the development of secondary specialized education. Thus, whereas there are 132 specialists with secondary specialized education per 100 specialists with higher education for the country as a whole, in the Georgian SSR there are only 70, in the Armenian SSR--83, in the Azerbaijan SSR--83, and in the Tajik SSR--93. This attests to a retardation of secondary specialized education's development in these regions.

Mistakes are being tolerated, as before, in the placement and utilization of specialists with secondary education. A substantial share of the technicians is assigned to jobs in the sectoral ministries and departments, at their enterprises, and in their organizations. In industry alone, about 2.7 million specialists are employed in jobs not requiring a specialized secondary education for their holding.

Although the quota for graduating specialists was fulfilled for the country as a whole, individual ministries and educational institutions did not fulfill the plan because of extensive dropping of students for various reasons, including poor progress. The tekhnikums and specialized schools of the RSFSR, the Georgian SSR, the Kazakh SSR, the USSR Minlesbumprom [Ministry of the Timber, Pulp and Paper, and Wood Processing Industry], the Minstankoprom [Ministry of the Machine Tool and Tool Building Industry], the USSR Minenergo [Ministry of Power and Electrification], and others did not fulfill the quota for graduating specialists.

Correct assignment of the graduates, giving them jobs in strict accordance with their acquired specialties and skills, and ruling out random assignments of the young specialists have prime importance.

Many educational institutions afford their graduates an opportunity for independent job taking without the proper grounds for doing so. Although the number of such cases has decreased in comparison with 1980, it nevertheless amounts to about 10,000 persons.

The discipline of the young specialists' arrival for work at their assigned places defines the level of indoctrinational work in the educational institutions' collectives. In 1985 alone, over 15 percent of the tekhnikums' and specialized schools' trainees failed to arrive at their destinations in accordance with their personal assignments. These and other facts substantially affect satisfaction of the requirement for specialists.

The acceleration strategy advanced by the party permeates all 27th CPSU Congress decisions. The Basic Directions of USSR Economic and Social Development for the Years 1986-1990 and the Period to the Year 2000 adopted by the congress, in which the essence of the party's economic and social policy is embodied and specified, is aimed at the decisions' implementation. The strategic course in the area of domestic policy is aimed at expediting the country's social and economic development and bringing about profound reforms in all areas of the Soviet society's life. All of this presupposes, not just an expansion in higher and secondary specialized schooling's sphere of activity, but also the bringing of many thousands of people employed in the various production fields into organized training.

The educational institutions' directors and instructors, developing and intensifying a deep sense of responsibility for the end results of secondary specialized schooling's activity, must struggle in every possible way to fulfill the state quotas for graduating highly skilled specialists. Planning must become an active spur to the progressive economic decisions' implementation.

Higher and secondary specialized educational institutions will graduate over 10 million specialists during the 12th 5-Year Plan. The numerical level for the specialists with secondary education's training will be maintained. At the same time, fulfillment of the established training plan as a whole is closely linked to its fulfillment by every tekhnikum and specialized school in all specialties and all forms of training.

About 2,582,000 technicians of various specialties will be graduated--and over 756,000 agronomists, animal husbandry technicians, veterinary technicians, mechanical technicians, and electromechanical technicians for agriculture.

In accordance with the Basic Directions for Reforming General Educational and Vocational Schooling, the graduation of teachers of elementary grades and labor, and instructors of preschool institutions will be increased substantially. Whereas 610,000 of these were graduated during the 11th 5-Year Plan, during the

current one--821,000 will be graduated. The graduation of nurses, medical assistants, dental technicians, obstetrical assistants, other medical personnel, and specialists in new equipment and technology will increase.

A problem of paramount importance in planning specialists' training, taking development of the country's productive forces in regions of Siberia and the Far East into account, is that of ensuring a more efficient distribution of the specialists' training in regions being newly developed.

In accordance with the 5-year plan for training specialists, student enrollment has been set at over 1.5 million persons for 1990, including 1 million persons in daytime training, which is more than the actual enrollment in 1985. The greatest enrollment increase is envisaged in secondary specialized educational institutions of Central Asia's union republics and regions of the national economy sectors' intensive development in Siberia, the Far East, and the RSFSR's Non-Chernozem Zone.

Now, when our immediate and future tasks have been clearly defined, the time has come for most aggressive and energetic actions, aimed at implementing the decisions of the congress and fulfilling the planned quotas for the current year and the 12th 5-Year Plan as a whole.

Our plans for training specialists conform to the 27th CPSU Congress policy of accelerating the society's social and economic progress. Here are certain growth figures planned for 1987, both for the country as a whole and its regions.

In the specialist training plan for the second year of the current 5-year plan, student enrollment in tekhnikums and specialized schools is established in the number of 1,521,900 persons, including 991,300 persons in daytime training.

In student enrollment's relatively slight increase for the country as a whole, its greatest increase is planned in the secondary specialized educational institutions of a number of union republics and USSR ministries and departments. For example, student enrollment in tekhnikums of the Tajik SSR will increase by 8.1 percent, in those of the Uzbek SSR--by 6.5 percent, and in those of the Turkmen SSR--by 5.8 percent. Enrollment also will increase substantially in a number of sectoral ministries' educational institutions, especially in the new equipment and technology lines.

A significant expansion of enrollment for the shorthanded specialties is envisaged in the training plan, through sharp reduction in the enrollment for specialties in which training with some exceeding of the requirement has been customary during recent years. Such a step will make it possible to satisfy the national economy sectors' requirements for personnel more fully and reduce the number of shorthanded specialties. Thus, in 1987, enrollment for the health care specialties has been increased by 7,500 persons as compared with 1985. The increase in enrollment has concerned mainly the medical schools of the RSFSR, the Uzbek SSR, and the Tajik SSR. The opinion exists in a number of educational institutions that the most important thing is--to fulfill the enrollment plan. Yes, that is important. However, the bottom line is--obtaining the required number of well-trained specialists.

In 1986, for purposes of more efficient distribution of specialist training about the country's territory and also bringing the specialists closer to the greatest development of productive forces, the training of specialists was organized for the first time in 112 specialties at 140 secondary specialized educational institutions. This work will be continued in 1987.

In the specialties for production and operation of computer equipment and automated systems, enrollment will be increased by 12,700 persons, in those for robot equipment and flexible production systems--by 4,300, and in those for electronic and microprocessor control means--by more than 4,000.

The training of specialists for the sectors of industry and agriculture effecting implementation of the Food Program, solution of fuel and power problems, etc., is planned in accordance with these sectors' requirements. In executing the Basic Directions for Reforming General Educational and Vocational Schooling, the training of teachers of elementary grades, labor and drawing, and graphic arts, and instructors of preschool institutions will be increased by 6,300 persons.

Student enrollment in specialties for the sectors of industry putting out consumer goods, and for the services area has been established, in accordance with the quota, in the number of 138,000 persons.

The paramount task of the sectoral ministries and departments and the union republics' Minvuzes [Ministries of Higher and Secondary Specialized Education], as well as the planning agencies, boils down to bringing the training of specialists in all specialties into accordance with the national economy sectors' requirements for them by the end of the current 5-year plan, taking the specialists' efficient distribution about the country's territory into account.

In this connection, there should be a change-over in the near future to new, more progressive methods of planning specialist training and determining the current and future requirements for specialists with higher and secondary education. The study of requirements for personnel and the make-up of their vocational and skill structure must become prominent in joint activity of enterprises and educational institutions. Description of the specialists' work positions and precise determination of the functions and content of their workers' labor must be taken as basis. New personnel assignment lists, corresponding to the list of positions subject to filling by specialists, should be developed on this basis. In the process, it is necessary to establish well-founded ratios of specialists with higher and secondary education, and to expect more extensive utilization of the latter in all sectors of the national economy. Utilize them more extensively in the repair and operation of modern equipment and especially complex technological equipment.

The most important spur to higher and secondary specialized schooling's reorganization is its closer integration with production, and change-over to the new principles of relations. These mutual relations must be based upon specific long-term obligations of the educational institutions and the enterprises/organizations that foresee the parties' equal responsibility for the training, its quality, and the retraining and skill improvement of specialists.

Specific-purpose [Tselevaya] training of specialists with secondary education was begun upon the recommendation of the USSR Minvuz [Ministry of Higher and Secondary Specialized Education] at the end of the last 5-year plan. The extent of this training so far is not yet great. Its share in enrollment in daytime training amounts to just 15 percent in all (a little over 150,000 persons). True, in a number of ministries and departments, such training's share reaches 40 percent.

It should be noted that specific-purpose training, in the form in which it now is conducted, has a one-sided and, in a number of cases, formalistic nature. The industrial enterprises/organizations for which such training is conducted limit their role to just partial participation in the selection (and that not always) and assignment of secondary school graduates to training, and thereafter take almost no part in the training. The acceptance of mutual obligations here, strange as it may seem, is the rare exception.

The requirement of the Basic Directions for Reforming Higher and Secondary Specialized Education remains to prepare specialists in the VUZ [higher educational institution] or tekhnikum/educational institution for a specific job (technician, mechanic, agronomist, teacher, instructor of a preschool institution, etc.) and in such quality as will meet modern requirements.

The training of specialists in secondary specialized educational institutions during the current 5-year plan must be effected mainly in the form of specific-purpose enrollment for training, at the direction of enterprises, institutions, and organizations, of secondary school graduates from among leading workers, office employees, and persons discharged from the USSR Armed Forces, as well as young people living around or near the locations of these enterprises/organizations.

As practical experience has shown, the advantage of specific-purpose enrollment lies in the fact that it permits more fully satisfying the requirements for specialists of all union republics, economic regions, and individual enterprises/organizations, ensuring increase in the effectiveness and quality of the training process by concentrating the training of specialists in educational institutions having a material and technical base in keeping with modern requirements and highly skilled teaching personnel, reducing specialist training with low enrollment (30 persons), and eliminating duplication in the training of specialists within the confines of one city or region.

A contingent of students assigned to training by industrial plants, construction sites, kolkhozes [collective farms], sovkhozes [state farms], or enterprises or organizations in the form of interdepartmental or interrepublic cooperation, with the students' monetary allowances paid at their expense, should be ascribed to specific-purpose specialist training.

The mutual contractual relations of secondary specialized educational institutions and enterprises/organizations envisage equal responsibility of the parties for the quality of the specialists' training and their indoctrination in the spirit of communist morals.



The parties' obligations must be clearly fixed in a joint agreement on the training and skill improvement of specialists. The following might be sample obligations of an educational institution: To train the established (by agreement) number of specialists by type and level of vocational knowledge appropriate to the development prospects of the enterprise or sector for which they are being prepared; to improve training plans on the basis of the specialists' qualification descriptions, taking the equipment's development prospects into account; to instill in the students the skills and abilities to conduct organizational and educational work in production collectives and develop and make administrative and economic decisions, and the ability to analyze and foresee the sector's/enterprise's development trends; as a rule, to make a practice of the students' doing their course work and diploma projects on realistic production themes, and coordinating the themes with the enterprise; to develop, based on the overall curricula, calendar schedules for the students' engaging in production practice, which will provide for their effective practical training and direct participation in labor matters of the enterprise's/organization's collective and study of new production equipment and technology; to bring in leading specialists of the enterprise/organization in an established order to read lectures and conduct practical lessons in the tekhnikum on special disciplines; to study the effectiveness of the young specialists' utilization on the job, and, on that basis, improve the training documentation and ensure specific-purpose training of the specialists that meets the enterprise's/sector's requirements; to organize lessons for improving the skills of the enterprise's workers; and to manufacture needed products with student forces during the production practice period in the training production workshops according to the enterprise's/organization's orders.

The following may be considered among the obligations of an enterprise, institution, or organization: To take an active part in filling student enrollment in the tekhnikum by assigning working young people, and first of all, production leaders and persons discharged from the USSR Armed Forces, as well as local young people, in the numbers and by the specialties indicated in the joint agreement; to participate in the development of training documentation that takes the enterprise's specific features and its development prospects into account; to organize conducting of the students' production practice at a high level, and give the students jobs and duties in keeping with the specialty and skill being acquired in the educational institution; to ensure the bringing in of highly skilled production specialists in an established order for conducting training lessons on matters of the latest equipment, technology, and production and labor organization, for the developing of themes, supervising, and reviewing of diploma projects, and for the work of the state qualifying and examining commissions, as experts in evaluating draft training plans, curricula, textbooks and training aids, etc.; to create conditions for on-the-job production training of the tekhnikum's/specialized school's instructors, and give them scientific and technical documentation, GOST's [all-union state standards] and specialized literature; to take a direct part in creating and building up the training material base, constructing, reconstructing, and technically re-equipping the training laboratory base and the production training and living accommodations; to provide assistance in material and technical supply, transferring equipment, instruments, machinery, and mechanisms free of charge; to carry out the repair of buildings and facilities, development, production, installation, etc.

The national economy's change-over to a qualitatively new technical and economic base requires radical improvement in the vocational and Marxist-Leninist training of specialists.

The present students--tomorrow's specialists--must master modern knowledge and solid practical skills, know advanced equipment and technology to perfection, and possess a broad cultural outlook.

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1987

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## MOTOR VEHICLE INDUSTRY PLANS FOR 1987

Moscow AVTOMOBILNAYA PROMYSHLENNOST in Russian No 1, Jan 87 pp 1-3

[Article under the rubric "The Decisions of the 27th CPSU Congress in Life!":  
"The Horizons of the Second Year of the 12th Five-Year Plan"]

[Text] The year 1986 has been completed -- it was completed on the march and in an atmosphere of movement, research and renewal. It was the first one in the new five-year plan. Although its results have still not been completely summed up, it is already possible to say with complete confidence that the process of thoroughly restructuring our society, which was begun on the basis of the decisions of the April 1985 CPSU Central Committee Plenum and the program directions of the 27th party congress, is gathering strength and acquiring ever greater scope and depth. All of our people approve and support the policy that was developed by the party for accelerating social and economic development and qualitatively improving the life and activity of the Soviet people as an expression of their unanimous will.

There is a great deal of evidence for this; it is possible to see it everywhere: in production, in life, in the fiery and interested discussions of pressing problems during meetings of labor collectives and in the press, and in the sharp growth in the people's social and work activity. Not only our friends but also our foes have now been compelled to admit that 1986 was -- for the country -- a year of accelerating the rates with which the country moved forward on all very important avenues. This movement was carried out by mobilizing reserves, making better use of production potentials, and increasing order and discipline. The radical reconstruction of the national economy, which was promoted, the restructuring of the organizational structure of management, the formation of a new economic mechanism, and -- without a doubt -- the results in fulfilling the country's social and economic development plan were its real manifestations.

Here are several facts. The increase in national income and industrial production was the highest during the Eighties in the first year of the five-year plan. (For example, the following data was cited during the Sixth Session of the 11th Convocation of the USSR Supreme Soviet: The produced national income increased by 4.3 percent during the first 10 months of 1986, and the volume of industrial production -- by 5.1 percent. In this regard, 95 percent of the

increase in production was obtained through increasing labor productivity which increased by 4.8 percent and not the 4.1 percent that was planned.) The branches, which determine scientific and technical progress in the national economy, were developed with special intensity -- in particular, machine building, including our automotive building branch which fulfilled all of its basic tasks for the year and its adopted socialist obligations under the complicated conditions of the restructuring: The output of the automotive equipment and spare parts for it, which the national economy required, was increased; discipline in delivering these items according to contract obligations was raised; the production of a number of new, more modern and efficient models of motor vehicle transport systems was mastered; the range of consumer items was expanded; expenditures were decreased by carrying out design measures aimed at reducing the consumption of materials and using advanced construction materials; efficiency was increased through the use of rolled metals and other materials; and significant amounts of electrical and thermal energy and fuel were saved. A great deal was done to automate and mechanize production by developing the manufacturing of its own machine tools and by improving and expanding the system for servicing and repairing the motor vehicle equipment in operation. Problems connected with the social development of enterprises and organizations began to be solved noticeably better. The work to reorganize management was continued: New production and scientific production (the first in the branch) associations were established, the brigade form for organizing and stimulating work and brigade cost accounting were more widely disseminated, and the work of selecting, assigning and training cadres was improved.

All of this was undoubtedly so. However, the results of the first year of the 12th Five-Year Plan also support the words that M. S. Gorbachev spoke during his meeting with the party aktiv of Krasnodar Kray: "... There is still a long way to go to the genuine deployment that we need in order to achieve the strategic goals that the 27th party congress posed" -- it is necessary to relate this to the automotive industry completely.

Yes, the restructuring has begun, it is already taking place, and more attention than before is being shown toward the problems of accelerating scientific and technical progress, improving the structure of production, raising the quality of products produced, saving resources and livening up social policy. At the same time, however, some directors are concentrating this attention on individual and even private tasks and not on the entire management and control system in the enterprise or organization. As a result, the restructuring is being converted into a chain of successive widening bottlenecks-- not the reasons that they arise and into a collection of partial and incomplete solutions. The story of the ArmAvto [Armenian Motor Vehicle Association] automatic loaders is an example of this attitude: The specialists in this association only worked at fulfilling the production volume plan at any cost. Their products did not enjoy any popularity and simply did not find a market. However, when they seriously worked to improve the design of their items and their production processes and began to take steps to strengthen the worker personnel, incorporate order and improve labor and technological discipline, i.e., when they began to solve the problem of the quality of their items in an integral manner, the

picture began to change for the better: Respect for the plant's trademark began to grow in the eyes of their consumers -- although slowly.

It is possible to cite examples of a different type that correspond more to present requirements. One of them is the work of the Minsk Motorcycle and Bicycle Plant's collective, in which approximately the same situation as in the Yerevan automatic loader plant arose at the end of the Seventies. The plant management, headed at the time by M. V. Dovnar, saw the solution to lie in the complete reconstruction of the enterprise, modernization of its equipment and a shift to the production of more modern motorcycle and bicycle products. The collective supported this initiative. As a result, the task was fulfilled and it was fulfilled using their own forces and while production continued. The plant is now confidently solving the tasks of the 12th Five-Year Plan.

The year 1986 also revealed other shortcomings in the work of the branch's labor collectives. However, it has permitted the carrying out of work in anticipation of solving the tasks of the second and subsequent years of the five-year plan. The main thing is that it proved the necessity of restructuring the economic thinking of the personnel, each worker thoroughly understanding the essence of the radical changes that are occurring in the economy and in the life of society, and putting into practice a new work style and methods. Just as the entire period in general that has passed since the April 1985 CPSU Central Committee Plenum, this year convinced us that complacency, placidity, admiration for initial successes, and, moreover, attempts to color the true state of affairs are things that are incompatible with the requirements of our life. That is why all of the branch's work collectives do not accept with indifference the severe criticism that is contained in the decree of the party's Central Committee "On Unsatisfactorily Carrying Out the Decisions of the CPSU Central Committee in Eliminating Eyewash and Additions by the Central Committee of the Moldavian Communist Party, Kirovograd Oblast Committee of the Ukrainian Communist Party and the USSR Ministry of the Automotive Industry" and in the decision of the Moscow CPSU City Committee on this question with respect to the directors of AZLK [Moscow Motor Vehicle Works imeni the Leninist Komsomol]. The measures, which were adopted by the Collegium of the Ministry of Automotive Transport in connection with this, have received the support and understanding of the branch's workers.

The careful consideration of the successes and omissions, the realism in their evaluation, and the orientation toward improving the interest of all of the branch's work collectives in the restructuring have permitted the Ministry of the Automotive Industry to develop a plan for 1987 that is directed toward strengthening and expanding the positive changes, which were achieved in 1986, more fully implementing the long-range factors in the growth of production, and carrying out the tasks that flow from the circumstance that the branch has become one of the five industrial ministries which will shift to complete cost accounting on 1 January 1987.

This plan has many fundamental distinctive features if one compares it with the plans of previous years.



First, the growth rates, that have been stipulated in it, have been established in accordance with those planned for the 12th Five-Year Plan and not the level of production expected at the end of 1986, i.e., the branch has rejected planning based on "what has been achieved" This approach will permit the operating associations and enterprises to implement successfully the reserves that are revealed during the plan's realization, and insure its overfulfillment without the fear of raising the indicator for the plans of the subsequent years in the five-year plan. Convincing confirmation of this is the adoption of increased counterplans by the collectives of a number of our motor vehicle works (this initiative is repeatedly reported in the press), and also by the branch as a whole.

Second, the tasks, which have been stipulated by the plan, require that work correspond to the average annual rates from the very first days of the year. As the experiences of many enterprises, in particular, that of the Vyaznikovskiy Automotive Tractor Lighting Fittings Plant shows, such work allows many very important tasks to be solved: the modernization of equipment, the incorporation of new items into production, the constant assurance of product deliveries in accordance with contract obligations by 100 percent, a sharp decrease in personnel turnover, and the solving of many social problems (the construction of housing, children's preschool institutions, etc.) using one's own forces.

Third, there are noticeably fewer approved indicators in the plan, whose values have been established by the ministry -- a significant portion of them are accounting ones and are compiled by the enterprises and associations themselves. Moreover, the total indicator -- 100 percent fulfillment of contract obligations -- is becoming the main indicator using which the work of the labor collective is evaluated.

Fourth, a norm approach to distributing profits between the state and the enterprise is found in the plan. Thanks to it, profit is transformed for the first time into a source of social and production development and is becoming a very important stimulus for the development of the enterprise.

Fifth, the entire increase in production is being achieved (also for the first time) through increasing labor productivity without increasing the number of workers.

Of course, this list of the distinctive features of the 1987 plan is not exhaustive. However, I think that what has been listed testifies sufficiently accurately to the fact that the plan is aimed at the more efficient functioning of the economic mechanism and the more complete use of the human factor, i.e., at the main item that is the primary moving force for accelerated development.

The 1987 plan is interesting not only because of the new indicators but also because they are based on an active use of the achievements of scientific and technical progress and provide for a decisive acceleration in the incorporation of its results (the main indicator is the up-dating of production) and a major increase in the technical level of the products produced. In 1987, for example, serial production of new and more improved KrAZ [Kremenchug Motor Vehicle Works] dump trucks; LiAZ [Likino Bus Works] large-class urban buses; and ZAZ [Zaporozhye Motor Vehicle Works], VAZ [Volga Motor Vehicle Works] and AZLK front-wheel

drive passenger vehicles will be mastered. The production of trucks will grow 2.5-fold and that of cars equipped with electronic control systems -- 2.3-fold. Many other measures have been planned for establishing and mastering the output of products which will be substantially higher based on their technical and economic parameters than those previously produced and which will be more competitive in the world market.

New and fundamentally new technologies and technological processes, which have either already been introduced or are being introduced into production, lie at the basis of the planning indicators. They include the following: laser and plasma processing, aerosol spraying, and the manufacturing of items using machine tools with programmed numerical controls and flexible production systems. Here, the building of one's own machine tools, which is continuing to be expanded (the output of such equipment will increase by almost 15 percent in comparison with 1986), is playing a role.

The most important element, on which the branch plan for the second year of the 12th Five-Year Plan is based, is a series of measures to save labor and material resources. These measures provide for the further development of production automation and mechanized systems, the reconstruction of enterprises and works (The volume can be judged from the following fact: the amount of iron, steel and nonferrous castings will grow almost 3.5-fold during 1987 in comparison with the previous year and the volume of using heat-stamped items -- almost twofold through reconstruction and technical re-equipping), the building of equally durable non-material intensive items (an example is the urban motor vehicle with a cargo-carrying capacity of 1.5 tons that was developed in the branch with the participation of Polish specialists), the widespread use of secondary resources (in particular, aluminum alloy wastes), the introduction of low-waste and resource-savings technologies, and a reduction in the amount of manual and heavy physical labor by mechanizing and automating such work (for example, eight automated and completely mechanized assembly lines, including the assembly of reduction gears for rear axles, front half-axles for motor vehicles, etc. will be incorporated into the Gorkiy Motor Vehicle Plant during 1987; six -- among them a line for assembling the pneumatic parts of the brake system, a line for assembling the thermal insulation of the cab, etc. -- in KamAZ [Kama Motor Vehicle Works]; two -- in KrAZ; four -- in VAZ; etc.).

The planned measures will contribute a great deal to the sharp increase in the quality of the products being produced, i.e., the solving of a problem which the 27th congress called one of the most important national economic problems. The state acceptance of products is being introduced into 1,500 of the country's enterprises on 1 January 1987 for this purpose. As we see, the branch is also making its contribution to this large task -- and not only by developing and incorporating technical measures but also by involving all enterprise and organization workers in it. For this purpose, the Ministry of the Automotive Industry together with the Central Committee of the motor vehicle, tractor and agricultural machinebuilding workers trade union have compiled a "Standard Statute on Quality Groups in Associations, Enterprises, and Organizations."

The quality groups are a voluntary public formation of workers, engineer technical workers and employees, which are formed in sections, shops, departments, laboratories and other subunits of enterprises and organizations with the task of preparing and incorporating suggestions for improving the quality of the products being produced and perfecting technological processes and work and production organization. However, they cannot be composite and transparent, i.e., consist of workers from the enterprises manufacturing the prepared products and allied enterprises. The suggestions of the quality groups should provide for the high reliability and durability of the items being produced, an increase in the percentage of products in the highest quality category, a decrease in rejects and claims, an increase in labor productivity, an improvement in the smoothness of production, and the rational and economic expenditure of labor, material and energy resources.

A special place has been allotted in the branch plan for 1987 to the task of increasing the production of consumer goods and consumer services and to accelerating the construction of housing and the construction of other non-production projects.

The task of expanding the amount and variety of consumer goods has not only been assigned to those associations and enterprises, for which these goods are the main type of production, but also to every other one regardless of its specialization. In connection with this, many branch production associations (AvtoVAZ, AvtoZAZ, Avtodvigatel, the State Order of Lenin Krasnaya Etna Works, ZIL, etc.) have planned to increase the production of these goods considerably. For this purpose, they are reconstructing existing works; building new shops and sections, including the use of construction modules; and arranging for the production of very simple items from waste products (the experiences of the UralAZ [Ural Motor Vehicle Works] and the enterprises of the Main Administration for the Bus Industry and the Main Ball-Bearing Administration are especially interesting in this regard). Decisions have also been made about increasing and improving the quality of technically complicated items. Thus, it is planned to begin production of the Oka VAZ-1111 minicar and to increase the production of modernized ZIL refrigerators, washing machines, motorized pumps, boat engines, and car vans -- and, of course, passenger car spare parts for market assets: their output will increase by 9-10 percent. In this regard, we cannot fail to note the following fact: the total output of spare parts in the range of products that most fully satisfy the requirements of automobile lovers will be increased. For example, 300,000 sets of piston rings (a 1.5-fold increase when compared with 1986), 425,000 sets of pistons (a 1.3-fold increase), 765,000 sets of root and connecting rod bushings, 700,000 camshafts, 12 million cardan shaft spider bearings, more than 4.5 million valve cap (gland) oil deflectors, 1.45 million storage batteries, etc., will be produced for VAZ vehicles. The output of spare parts for other passenger cars -- the GAZ, AZLK and ZAZ -- will also grow approximately the same. The continually expanding system for restoring worn-out items, units and assemblies is paying a very large role in this task. For example, the production of such items by the enterprises in the AvtoVAZ Production Association will grow by almost 30 percent and even somewhat more in the enterprises of the Moskvich and AvtoZAZ Production Association.

Not only the enterprises of our branch but also those of other branches and departments and enterprises in the CEMA member countries are participating in the work to produce spare parts for passenger cars belonging to citizens. All of this will undoubtedly permit the acuteness of the problem with spare parts to be smoothed out and the demand for them to be satisfied more fully.

Both the amount and list of services, which are provided to the population, will be expanded during the second year of the five-year plan. For example, their amount will grow by almost six percent in the AvtoVAZ Association, more than six percent in the Moskvich Association, and by almost 4.5 percent in the Avto-ZAZ Association. For this purpose, a further expansion in the STO [service station] capacities, the construction of a number of new STO with 20 and 10 work positions, and the commissioning of spare parts centers, including the largest in the city of Tolyatti, have been provided for. Such comparatively new forms for providing services as diagnostic services for automobile systems using STO forces and equipment, the providing of work places and consultations to automobile lovers, the exchange of defective items and units for repaired ones, the organization of posts in garage cooperatives, etc., will be further expanded.

As has been mentioned, questions concerning the social development of the branch, primarily the most important one-- providing housing for enterprise and organization workers -- occupy a special place in the plans for 1987. In particular, the initiatives of the collectives in the Gorkiy Motor Vehicle Works (to provide each family with a separate well-built apartment by 1985) and VAZ (to work four days a year on building housing projects and social, cultural and consumer projects) as well as the joint decision on this question by the ministry of the Automotive Industry and the Central Committee of the Motor Vehicle, tractor and agricultural machinebuilding workers trade union have found reflection in the plans. These plans are based on the results from inventorying the housing assets that exist on the balance sheets of associations, enterprises and organizations; determining the families that need improved housing conditions; working out steps to develop an economic method for construction which is regarded as the main one; searching for opportunities to reduce the new construction of production projects without damaging production tasks, transferring the assets freed by this to the construction of housing; calculating the amount of construction of youth housing complexes; determining the sources for its financing; etc.

As we see, our branch will simultaneously solve many complicated tasks this year: mastering the production of new models of motor vehicle equipment, radically updating technology, raising the technical level of items, improving their quality, making economy and thrift conditions stricter, strengthening discipline -- state, work and technological -- and order, solving social development tasks at accelerated rates, and doing all of this simultaneously and in an integrated manner. The success of the task requires, it is evident, a great deal of effort, ability, coordination and work, and persistence. Thus, the year will not be a simple one -- it will be a critical one. The more so since it is the 70th anniversary of Great October. That is why it is especially important that all levers in the restructuring operate at full power during the anniversary year and that new approaches to the solution of economic, technical and social problems provide an important return.

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## MOTOR VEHICLES, HIGHWAYS

### MINISTRY REVIEWS KamAZ PRODUCTION PLANS

Moscow AVTOMOBILNAYA PROMYSHLENNOST in Russian No 1, Jan 87, p 3

[Article: "KamAZ Restructuring"]

[Text] During one of its sessions, the scientific and technical council of the Ministry of the Automotive Industry examined the question of the technical level of the motor vehicle equipment being produced by the Kama Association in the production of heavy-duty trucks.

In its decision, the council pointed out that the KamAZ [Kama Motor Vehicle Works] specialists have performed a great deal of work to improve the design and production technologies for the motor vehicles, expand their range of products, and increase consumer qualities. In particular, it approved the suggestion of the production association's collective about increasing during 1987 the life (before overhauls) of motor vehicles, engines and all assemblies to 350,000 kilometers logged and reducing fuel expenditures by all families of automobiles by 10-13 percent by 1990. It also approved proposals in the area of technology that were aimed at raising the technical level, reducing labor-intensiveness and saving material resources.

The scientific and technical council also stressed the correctness and timeliness of the KamAZ proposal to build capacities for the production of small-series motor vehicle equipment and that these capacities should be based on flexible technologies and insure the output of 3,000 - 5,000 motor vehicles of the new models a year.

The council also gave a number of recommendations that supplemented and expanded the proposal of the association's collective. These concerned the building of capacities for the production of plastic items intended for their own works; the continuation of work to produce future models of KamAZ motor vehicles, including modular truck trains; jointly (with the Ministry of the Petroleum Refining and Petrochemical Industry) working to improve the quality of tires and to incorporate the wider use of radial tires with reduced losses due to the rolling motion; instituting 100 percent incoming control of component items; developing jointly with supplying plants measures to improve the life and reliability of component items to the level of the requirements being imposed on KamAZ motor vehicles; etc.



It also approved the KamAZ initiative about producing three families of motor vehicles: three-axle ones with an axle load of six tons; two- and three-axle ones with an axle load of eight tons, and two-axle ones with an axle load of 10 (13) tons. The proposal to produce engines in three types-- without a supercharger, with a turbo supercharger, and with the intermediate cooling of the supercharged air--also found support in the council.

The incorporation of all of these measures will undoubtedly contribute to strengthening respect for the KamAZ trademark in the world market and will improve the national economic effectiveness of the association's motor vehicles.

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## RAIL SYSTEMS

### MINISTRY REVIEWS BAM CONSTRUCTION PROGRESS

Moscow GUDOK in Russian 18 Feb 87 p 2

[Article by I. Krasikov, GUDOK correspondent, Tynda: "They Are Not Hurrying To Make Up for What Was Omitted"; first paragraph is GUDOK introduction]

[Text] A travelling collegium of the Ministry of Transport Construction convened in Tynda. It examined the question "On the Progress In Building the Baykal-Amur Railroad Mainline and Measures To Insure the Completeness of the Construction of Installations on the Mainline and To Carry Out the Work Plans and Special Purpose Tasks for this Construction Project During 1987 and the Subsequent Years of the 12th Five-Year Plan."

The ministry's collegium analyzed the activity of the subunits engaged in the construction of BAM [Baykal-Amur Mainline] and examined the reasons for the shortcomings. A great deal of attention was paid to the restructuring of the management mechanism in light of the requirements of the 27th congress and the January 1987 Plenum of the party's Central Committee. Significant work has been done in building the mainline and also the installations of the other ministries and departments located in the BAM zone. During past years, 1,651 kilometers of railroad track were commissioned for permanent operation and 712,000 square meters of housing, kindergartens and schools -- 6,600 and 16,500 places, respectively -- were built.

At the same time, the collegium pointed out that the restructuring, on which the successful solution of the main task -- the commissioning of the entire length of the Baykal-Amur Mainline for permanent operation in 1989 -- depends, is taking place slowly. The construction of locomotive and auxiliary facility installations is lagging behind; and housing, social, cultural and consumer projects and the engineer support system are not being built at sufficient tempos. Hardly more than half of the assets allotted for this have been assimilated; and, consequently, the builders must realize the second half in the next three years. Four of the 10 trusts in Glavbamstroy [Main Administration for the Construction of BAM] have not fulfilled the general contractor's plan and are lagging behind in an amount of 14.2 million rubles.

Glavbamstroy has not insured the carrying out of the tasks to prepare the back-log that were stipulated for 1986. On the Nizhneangarsk-Uoyan section,

which must be commissioned in the third quarter of 1987, the Nizhneangarsk-transstroy [Nizhneangarsk Transportation Construction] Trust has not handed over 77 kilometers of the catenary system and the traction station at Kichera for installation. The task of installing a 175-kilometer line of the catenary system foiled the electrification of the Transbaykal Railroad between Skovorodino and Yerofey Pavlovich on a section that was commissioned during the second and third quarters. Individual subunits of the main administration have tolerated losses over and above the plan.

The military railroad workers have also reduced tempos. The lagging behind on Tynda-Urgal and Urgal-Berezovka is significant.

The collegium pointed out that, with the successful fulfillment of the annual plan for subcontractor work on the BAM complex, the subunits of the Glavtonnel-metrostroy [Main Administration for Tunnel and Subway Construction] are building the Severomuyskiy tunnel slowly. With a target of a thousand meters in 1986, only 717 were driven. Criticism was addressed to Glavmostostroy [The Main Administration for Bridge Construction] for disrupting the planning targets for the BAM complex, which the Mostostroy-9 Trust had tolerated in the Ust-Kut-Nizhneangarsk section and the Mostostroy-8 Trust -- in the Tynda-Urgal section. Low results in the work of Glavtransproyekt [Main Administration for Planning and Surveying] were pointed out. The bridge builders disrupted the work on the Severomuyskiy tunnel by-pass because of the untimely issuance of the documentation.

The collegium pointed out that all BAM construction and installation organizations had performed significant preparations for shifting to complete cost accounting and self-financing. At the same time, the sluggishness and slowness during the introduction of an advanced work organization and new equipment and in carrying out the Intensifikatsiya-90 Complex Plan, has still not been overcome.

The collegium talked about the need for strengthening the contribution of the chief organizations to the construction of the mainline, increase work quality, and pay special attention to the further development of the builders' own subsidiary farms and the supplying of the BAM people with food products and consumer goods. There should be no interruptions in this important task.

Even more complicated tasks face the collectives in 1987. The volume of construction and installation work in the BAM zone is growing by 15 percent; and for the Baykal-Amur Mainline -- by more than a fourth. A total of 493 kilometers of line must be put into permanent operation; 179 of them must be electrified. A total of 93,000 square meters of housing must be handed over and the construction of the Severomuyskiy tunnel and a permanent railroad by-pass must continue at accelerated rates. In addition, a large amount of the electrification of the Transbaykal Railroad and the construction of secondary tracks in the Khrebtovaya-Lena section will fall to BAM subunits.

It will not be simple to cope with such tasks. The collegium has worked out measures for the unconditional fulfillment of what has been planned.

The BAM workers must concentrate their attention on concrete tasks and the realization of the planned solutions and measures for restructuring the work of all links on the basis of a general shift to economic management methods; widespread use of complete cost accounting, the principles of self-financing and self-supporting production [samookupayemost]; and the application of long-term stable economic norms. It was recommended that the main attention be paid to erecting projects in strict accordance with the norm periods; providing for transferring the limiting sectors to two-three shifts; mobilizing existing reserves in every way possible; putting organizational, economic and social factors into operation; strengthening organization, discipline and order; and making rational use of already built production potentials. The collegium directed the attention of the chiefs' representatives to the necessity of developing the capacities of their construction organizations that are building settlements and stations on the Eastern Section of the mainline in order to hand over all of the required installations within the prescribed time.

A. G. Melnikov, chief of the Construction Department of the CPSU Central Committee; V. A. Brezhnev, minister of transport construction; I. A. Shinkevich, chairman of the Central Committee of the Rail Transport and Transport Construction Workers Trade Union; L. A. Bibin, first deputy chairman of USSR Gosstroy; N. K. Isingarin, deputy minister of railways; secretaries of party oblast committees; the directors of a number of ministries and departments; and responsible workers from the staff of the CPSU Central Committee and the USSR Council of Ministers participated in the work of the collegium.

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## RAIL SYSTEMS

### BAM, AYAM CONSTRUCTION PROBLEMS DISCUSSED

Moscow STROITELNAYA GAZETA in Russian 11, 12, 13 March 87

[Article by Ye. Sorokin, STROITELNAYA GAZETA special correspondent: "BAM-AYAM: Lessons and Prospects;" first two paragraphs are STROITELNAYA GAZETA introduction]

[11 Mar 87 pp 1,2]

[Text] A recent session of the collegium of the Ministry of Transport Construction was recently devoted to the problems connected with the construction of BAM and the new Berkakit-Tommot-Yakutsk line. A. Melnikov, chief of the Construction Department of the CPSU Central Committee, and the directors of the USSR Gosstroy, Ministry of Railways, USSR Ministry of Construction in the Far East and Transbaykal Regions, RSFSR Gosstroy, and the republics, krays and oblasts that look after BAM, participated in its work. It was unanimously recognized that radical steps are needed to insure that permanent operation of BAM begin in 1989 and that operational movement of trains from Berkakit to Tommot begin by 1990.

Our special correspondent also participated in the session of the collegium. He had visited the labor collectives, become familiar with the progress of work on BAM and AYAM, and talked with the builders and the directors of local party and soviet bodies. We are beginning the publication of his notes today.

#### 1. After the "Gold Link"

It seems that it was a long time ago that two trains with distinguished passengers from the Western and Eastern sections met in Tynda. Orchestras thundered in the capital of BAM. The people did not conceal their happy smiles and joyful tears. The through movement of trains over the entire route was opened on that holiday occasion on 27 October 1984.

The builders were justifiably proud of what had been done. Under unbelievably difficult conditions, they had laid 3,500 kilometers of railroad track and erected 3,348 man-made structures, including 1,987 bridges -- 142 of which were more than 100 meters long. By that time, eight tunnels with a total length of more than 17 kilometers plus eight kilometers of the largest 15-



kilometer Severomuyskiy Tunnel had been built on the right-of-way, and 370 million cubic meters of earth had been processed.

Yes, these figures cast their spell two and a half years ago. However, cautionary voices were already being heard at the time among the holiday fireworks: Wait to proclaim the final victory; after all, the handing over of the sections for permanent operation lies ahead.

It is necessary to ballast the track, pack the embankments, "plant" thousands of service and technical buildings and all-electric interlocking posts along the main line, place switches in the stations, erect power transmission and communications lines, and -- what is most important -- construct hundreds of thousands of square meters of housing and numerous social infrastructure items.

A new insidiousness of a BAM nature had already appeared in the spring of 1985. The embankments and slopes of some cuts "started swimming." It was necessary to take urgent steps. The strengthening of the embankments with granite rock was work that was ignoble, labor-intensive and expensive.

At the very beginning of the route, the Severomuyskiy tunnel, which was located in an area of increased seismic activity and which was constantly being flooded by a large influx of ground water, remained impassable. The designers came to the conclusion that the only dependable plan was to construct a second route over an open right-of-way: as an unforeseen circumstance. They estimated the cost at 400 million rubles.

The permafrost behaved in a strange way at Zeysk. It turned out that the Zeysk reservoir had ameliorated the climate in this area. The scientists suggested that there would not be any permafrost here at all after about 50 years. No one was able as yet to say how the layers of earth would act.

However, the majority of BAM subunits were unprepared for the new work profile. The machine operators, bridge builders and track layers had encountered a need to re-qualify themselves as bricklayers and plasterers and as electricians and house painters and to perform "cheap" work based on former concepts. Everyone did not like this, and BAM began to experience a shortage of working hands for the first time. Even today, the commissioning of several projects, which were planned for 1989, is inspiring serious doubts.

Ye. Basin, deputy minister of transport construction and chief of the BAM Construction Main Administration, told me after the collegium: "Now, the main thing for us is to break the psychology of dependence. You see, under cost accounting [khozraschet] conditions, relying on imported materials and designs means becoming bankrupt deliberately. It is necessary to develop our own construction industrial base."

The reconstruction of the Shimanovsk Construction Industry Combine, which has been transferred to the jurisdiction of the BAM Construction Main Administration, is taking place at an unjustifiably slow pace. Moreover, last year's plans were "tied" to the output of the Tayshet Construction Industry Complex which simply was not working at the beginning of the year. Even now,

it has hardly achieved 20 percent of its design capacity. The BAM Brick Plant and the Kunerma Integrated Logging-Lumbering Enterprise are working below their capacities. Even if one assumes that the transport construction base on BAM will reach its design capacity, it will only be able to provide the construction project with 80 percent of the required reinforced concrete items.

The shortage of construction materials for BAM is also new. The trouble is that the suppliers forgot their obligation: "A 'green light' for BAM freight", after the "golden link." Now, no matter where you look, there is a "red light" everywhere.

Even our own Ministry of Transport Construction suppliers are not keeping their word. The Dmitirovskiy Reinforced Concrete Bridge Structure Plant and the Chernogorskiy and Kryazhskiy Reinforced Concrete Items Plant are among them. In this regard, there is the paradox that BAM workers are frequently inundated with reinforced concrete items. At any station, you will find mountains of panels which are impossible to put to work: They first bring items for the upper stages; and after six months -- those for the lower ones.

The problem of deliveries is especially acute for railroad worker servicemen. Having become the exclusive master of the entire BAM construction industry base, the BAM Construction Main Administration has seemingly forgotten its eastern neighbor.

The following example testifies to the nature of the mutual relations between the partners. Before the collegium, I sat in the office of A. Frolov, the deputy chief of the BAM Construction Main Administration. He clicked the selector and I heard a voice:

"Anatoliy Nikolayevich, Colonel Petrosov from the railroad troops administration was just here. We had promised 112,000 cubic meters of crushed rock, and we are not able to provide it. What should we do? He is threatening to raise this question during the collegium."

Frolov was silent for a long time. Finally, he replied:

"Do what you want, but do it so that there will not be any noise at the collegium. Promise mountains of gold... Well, give them 80,000 cubic meters -- that will suffice."

I am not convinced that the railroad troops will receive even this minimum with such an approach to the task. Is it surprising that the BAM troops did not fulfill the plan last year for the first time in 13 years? You see, the primary reasons for the disruption are the lack of obligation on the part of the suppliers and the failure to coordinate the actions of all sectors in the construction project.

Meanwhile, the plan and the special-purpose tasks for 1987 require just the opposite. The BAM workers must now perform almost one-quarter more work than last year. They are faced with putting the 179 electrified kilometers from Nizhneangarsk to Uoyan, the 150 kilometers from Khani to Ust-Nyukzhi, and the

165 kilometers from Dipkun to Zeysk into permanent operation. It is necessary to submit all three construction starts to the state commission not during the fourth quarter as before, but during the third. Only in this event will they be insured against waste. It turns out that time has now been compressed to the limit.

It would seem that all of this should be well understood in the Ministry of Railways. However, there is still no complete clarity there about determining the extent of the construction starts. Worse than that is the fact that there is no design and cost estimate documentation for many commissioned projects.

Strange to say, the designers and researchers are lagging behind the builders. Quite often, the BAM workers encounter very gross miscalculations and callous work. In Zeysk, for example, Amurgeologiya performed work to find drinking water. Based on its plans, the builders "attached" a settlement -- but the water turned out to be unsuitable for use: It had a great deal of iron and hydrogen sulfide. The settlement, which is located on the bank of the Zeysk Sea, is being built at top speed, and they are carrying water dozens of kilometers.

During construction, the need to coordinate with the design institutes -- the Mosgiprotrans [Moscow State Design and Research Institute], Lengiprotrans [Leningrad State Design and Research Institute], Uralgiprotrans [Ural State Design and Research Institute], and Kievgiprotrans [Kiev State Design and Research Institute] of the Main Transport Design Administration -- now and then arises. It has long been time to create an operational design group in BAM. Discussions about this have been under way for a long time, and the cart is now there.

The abundance of design organizations, which are working for BAM, gives birth to a mass of problems. The Ministry of Railways is allotting money for designs, the Ministry of Transport Construction is emerging as the general designer and sponsoring organizations are developing the plans for settlements. From here comes the enormous number of every possible modifications that are frequently -- speaking to the point -- not noted for taste or an industrial nature in their execution.

I remember the complaints of I. Panov, chief of the Moldavbamstroy construction work train, whom we met in Dugde:

"It is a shame to build the houses which Uralgiprotrans has designed. Based on their architecture, they do not satisfy the new requirements at all -- and this after those which we built in Alonka. They call that station a 'beauty' and the 'pearl' of BAM -- but what do they call this one?"

Nevertheless, it is a sin -- as they say -- for Igor Aleksandrovich to complain. He should have tried to put himself in the position of the director of the Penzabamstroy construction work train. In 1985, this collective was transferred to the station of Meunchik and was received in a friendly manner. One and half million rubles were spent on building a temporary settlement for the construction personnel -- only it turned out that the station ... was not needed. Not that the oblast and this kray, of course, did not need it as

another settlement of good quality in the taiga. The Ministry of Railways simply can do without it in connection with the increase in road sections ... why?

More and more, you are encountering such questions today on BAM -- and not only on BAM. The Amur-Yakutsk Main Line, or AYAM, is unfortunately already beginning to repeat the mistakes of BAM during its initial stage. The next article, however, is about this.

[12 Mar 87 p 2]

[Text] 2. The Final Station -- Yakutsk

The Amur-Yakutsk Main Line can rightfully be called the daughter of the BAM construction project. What do the 830 kilometers of steel rails represent based on work projects? They represent approximately 40 million cubic meters of excavations and 447 man-made structures, of which there are 17 large (more than 100 meters) bridges. However, it is necessary to initiate operational movements of trains over AYAM by 1990 so as to put the road into permanent operation by the end of the next five-year plan.

You will agree that it is not an easy matter to begin the building of a new transport artery while work is in full swing on BAM. Today, approximately 5,000 transport construction personnel -- the overwhelming majority are former BAM workers -- are working here. Were they not in a hurry to begin the construction project? Were they not chasing two rabbits?

Yu. Prokopyev, first secretary of the Yakutsk CPSU obkom, says: "There is simply no other way. The fact of the matter is that approximately six million tons of freight are delivered on the Lena to Yakutia annually. The main artery of the kray -- the Lena -- is becoming shallower from year to year and -- in the opinion of scientists -- this process will grow progressively worse. By 1990, however, it will be necessary to import approximately nine million tons of freight into Yakutia. Today, for example, it is necessary to burn a ton of fuel in order to deliver a ton to Yakutsk. The state loses hundreds of millions of rubles on these shipments alone each year.

AYAM has been called a delivery road based on its technical and economic basis. A strange definition. It's as if there is nothing to export from Yakutia, that very rich kray. Take, for example, the Kangalassy coal deposit. It is located not far from Yakutsk, and the "black gold" reserves here simply do not submit to computation .... It seems that nature itself was concerned that the Berkakit-Tommot-Yakutsk right-of-way touch the richest Yakutsk lands while travelling an ideal straight line on a map. These are the Tarynnakhskoye, Desovskoye and Tayezhnoye ore deposits, the Seligdarskoye apatite deposit and gold-bearing Aldan.

Moreover, BAM is intended for the long-range future in many respects, but AYAM is necessary today -- now. The absence of this steel artery is holding back both the development of Yakutia's production forces and the growth of the republic's contribution to the country's national economy. But what about this road? I will specify right away that its technical design has still not

been approved although work is being performed in the taiga. This permits the question of correcting mistakes committed during the design state to be raised.

The fact of the matter is that they planned to construct AYAM as a single-track line. The sad experience of Little BAM is eloquent testimony regarding just what this threatens.

V. Gorbunov, chief of the Baykal-Amur Railroad, told me during a meeting: "This line is literally sewn up today. Its capacities were completely used up three years ago. We are now building a second track: There is no other way out."

At one time, you see, the scientists warned that the intensive development of the South Yakutsk Territorial Production Complex would "crush" the single track. Alas, no one listened at the time to their opinions. What does the laying of a second track mean today when the road is operating in a super-strained condition? It means "putting down" a road-bed, erecting new bridges and man-made structures, installing switches, and transferring electric power line supports. It means again constructing temporary settlements for the builders and plucking people from other work. It has been estimated that the laying of the second track will be almost 1.5-fold more expensive for the state.

Ye. Basin, chief of the BAM Construction Main Administration, says: "We are in favor of building a first category road and constructing it as the times require: of good quality, reliable, and forever. They are suggesting that we use weak R-50 rails which quickly wear out, and that we use a sand and gravel mixture instead of crushed rock as ballast. I am afraid that it will then be necessary not so much to operate the road as to repair it."

What does the owner of the future road, the Ministry of Railways, think? The detail design of AYAM has become dusty for a month in its offices, and the builders do not have a clear picture in front of them.

The system for financing it has also not been set up. Long ago, the time became right for the USSR Stroybank to open a branch on AYAM. While the road is "dependent" on the Baykal-Amur office of Stroybank, this creates a mass of inconveniences for the builders.

It was the middle of February on the calendar, and the manager of the Tyndatransstroy [Tynda Transport Construction] Trust, S. Volkovinskiy, was complaining:

"You can imagine the situation - we still do not know what volume of construction and assembly work must be performed this year. This is under the conditions of a collective contract! When compiling the plan the numbers 41 million, 52 million, 68 million, and -- finally -- 70 million came up. But what is 70 million for us when we would be able to "extract" all 150 without any effort."

However, "extract" 200 for the trust and, with such construction rates for AYAM, the coming five-year plan might well become a five-year 'storm'.

Yu. Prokopyev, first secretary of the Yakutsk CPSU obkom, thinks: "The way out is seen in the establishment of the Yakuttransstroy Trust general contractor. This is extremely necessary for the better operational management of construction, greater maneuverability of resources, and the sound solution of prospective problems. There is no sense in managing from Tynda and from Amur Oblast the building of a railroad which travels completely on the territory of Yakutia. This has already led to the fact that they are building 52 projects in Tynda at the expense of AYAM titles and that they want to divert 300 million to establish a base and to take money from this same "pocket" to reconstruct Berkakit. I do not profess a local approach; We are talking about financial and planning discipline. It could turn out otherwise -- the road, which is still not constructed, could become bankrupt.

Based on the degree of difficulty, there is no comparison between the Berkakit-Yakutsk right-of-way and BAM. This is not only because the terrain is flatter and there are significantly fewer rivers here. The fact is that they are already building housing cities and settlements on the right-of-way, and that is why the transport builders do not have to begin from zero. It would seem that there is no obstacle to the first passenger train arriving in Yakutsk from Moscow in 1995.

To put it mildly, however, such a happy ending is problematical. AYAM has three main barriers which have still not been addressed. We are talking about the bridges across the Amgu, Aldan and Lena.

V. Shmidt, manager of the Mostostroy [Bridge Building]-10 Trust, says: "The railroad bridge across the Lena must be one of the largest in the country. According to the norms, eight years are required to build it -- that is, it is necessary to begin it immediately. However, we still do not have the survey results, feasibility study or the plans."

As we see, the "daughter" right-of-way has inherited from BAM quite a few of its blunders. However, whereas it was possible to call them growing pains there, different evaluations suggest themselves here. Take the establishment of its own construction base. During the 12th Five-Year Plan alone, it is necessary to build approximately 340,000 square meters of housing along the right-of-way. The republic's capabilities are indeed a buried treasure for the builders. However, they are not being used rationally -- even by the operating DSK [house construction combines].

For example, a DSK with a capacity of 100,000 cubic meters of reinforced concrete items a year, which was built with a shared participation of the USSR Ministry of the Coal Industry and the USSR Ministry of Power and Electrification, is operating in Neryungri. The Ministry of Transport Construction would have liked to have joined in the shared participation also. Not at all! "A monopolist" -- the Ministry of the Coal Industry provides panels even to its vital shareholder reluctantly. It does not want to hear about the participation of the Ministry of Transport Construction in the expansion and joint operation of the DSK. The same situation has taken shape



in Aldan where the housing construction combine of the USSR Ministry of Construction in the Eastern Regions of the USSR is located and in Yakutsk.

V. Brezhnev, the minister of transport construction, says: "The need to establish our own house construction combine has been brought to our attention. It will cost us 25 million rubles at a minimum and it will be more than a year until the enterprise reaches its design capacity. The building of 'annexes' for these three operating combines is significantly cheaper, and -- what is the main thing -- we would receive the necessary products after a year. The placement of the enterprises along the entire AYAM right-of-way will permit us to save considerable resources even when transporting items."

The integrated development of Siberia is unthinkable without close contacts between all ministries and departments. Here, as in no other part of the country, the losses from departmental disconnections are especially great.

BAM and AYAM -- these are not simply new main lines. They are a new stage in developing the economy of the country's eastern rayons. The USSR Academy of Sciences Far East Scientific Center's Economic Research Institute has compiled a complex program for developing the BAM zone. All told, more than 20 designations of mineral raw material have been found here. More than 60 billion tons of raw material are estimated to be in the iron ore deposits, and the reserves of bituminous and brown coal are rated at 64 billion tons. A great deal of ferrous and noble metals, phosphate raw material and building material is located here.

It is rare on the planet to be able to encounter such a unique combination of mineral resources as has been located in Yakutia. One-fifth of the Soviet Union's timber resources -- four billion cubic meters of wood -- is in BAM's eastern section.... It would seem that the interested ministries and departments should swoop down on these riches like bees to honey.

Unfortunately, the reverse is happening. The need to build high quality and comfortable housing and to establish a network of consumer services and cultural establishments -- yes, and moreover an order that is higher than in the settled rayons in order to attract people to this sparsely populated region -- is scaring them away. If this abnormal situation is not changed, the Baykal-Amur Railroad will be in a paradoxical situation: those, for whose sake it was built, will not be ready to use its services.

It is impossible to separate the fate of BAM and AYAM from the fate of that gigantic region which they have been called upon to provide a "second wind" to. One cannot tolerate these unique transport arteries waiting years for their "starlit hour." This will not happen if we today think about making living and working conditions here significantly better than the "European" ones. However, a special discussion of this.

[Text] 3. From the Captivity of Stereotypes

Perhaps there is no more burning problem on BAM than the social one. Here is an eloquent fact: 78 percent of the assets, which were remitted for production needs and only 50 percent of those for housing and social, cultural and consumer services were assimilated during the years of constructing the main line.

Years have passed. The main line is already letting trains pass. Quite truthfully, they say that it is helping to build itself. The BAM workers have posed a quite logical question: Is it not time to work in real earnest on route living conditions? And not simply because, having become settled (the average age is now approaching 29), the builders have acquired families and children. The trouble is that their enthusiasm has not been reinforced for a long time with a solid social home front. This is also the consequence of annoying blunders that were committed during the forecasting of the situation. The rapid growth in the number of inhabitants in BAM settlements outstripped all planning calculations: Previous rough drafts were exceeded manyfold.

V. Gorbunov, the chief of the Baykal-Amur Railroad says: "How many more must come and take root! Our staff now has approximately 35,000 people. With the commissioning of the road for permanent operation, the number of workers will grow twofold here. Consider that, as a rule, they will be young people -- prospective families."

The USSR Gosplan and the USSR Academy of Sciences Siberian Department have developed a complex special-purpose program for developing the national economy in the BAM zone. However, its realization is clearly lagging behind the needs of the BAM workers.

Where the shortsightedness in social policy is leading is clearly evident in the example of Dipkun. I have had occasion to visit this settlement more than once. I remember it as a typical tent city. Since that time, the settlement has grown fivefold. Just as everywhere on BAM, the birth-rate is very high here. During last year alone, 146 small children were registered in the rural soviet. Under what conditions will these indigenous BAM people live? Judge for yourselves. Approximately 700 families are standing in line here to receive housing, and others live in reconverted railroad cars. Approximately 1,000 children are sitting at desks in a school that was built for 390 pupils. There are not enough kindergartens, service area enterprises and cultural establishments. How can one provide spiritual "food" when bread is vital? -- and that is the problem: They bake it in a small plant whose design is almost 30 years old.

This settlement's troubles, unfortunately, are typical of the majority of the other population centers that have grown up on the main line. The Ministry of Transport Construction has seemingly forgotten for many years whom the unique railroad was laid for.

However, it is not only this ministry that has become "forgetful." They rightfully call the construction project a national one: a total of 14 republics and 30 krais and oblasts have assumed sponsorship of it.

However, ... they laid the "golden link", and several sponsoring organizations went home. Others, as -- for example -- the envoys of the Ukraine, Uzbekistan and Novosibirsk, reduced their staffs considerably. The sponsors began to forget about ... sponsorship.

In order not to make unsubstantiated statements, I will cite specific facts. On 1 January of this year, the builders from Belorussia had failed to assimilate almost 28 million of 31.2 million rubles. Meanwhile, they will have to construct approximately 22,000 square meters of housing, a hostel, a kindergarten, and a school during the remaining three short years.

The envoys of Latvia have still not built a single square meter of housing of the planned 5,300. Ali told, the sponsors from Armenia have assimilated only two million rubles of the 12. There are many examples like this.

A. Samoylenko, deputy chief of the BAM Railroad construction directorate, continues the discussion: "An especially alarming situation has taken shape in Fevral'sk. The Krasnoyarskbamstroy [Krasnoyarsk BAM Construction] PMK [mobile mechanized column] has only assimilated approximately 40 percent of the required amount. Of the remaining 115 million rubles, they are undertaking to perform work valued at only 72 million rubles.

It has been calculated that for the sponsors to be able to carry out their responsibilities to BAM by 1989, they must increase rates 2.5-fold at a minimum.

You see, however, sponsorship of the main line is not limited only to purely construction help -- especially as it has a "crying" nature at times: In other sponsoring organizations, up to 40 percent of the workers are from the local population, and the BAM Construction Main Administration sends materials to them.

Ye. Basin, chief of the BAM Construction Main Administration says: "However, let us give thanks for this. As they say, do not look a gift horse in the mouth. But why has sponsorship 'become cyclical' today only in production? You see, formerly Uzbekistan sent grapes especially for the BAM workers, Georgia -- tangerines.... Each republic considered it to be its duty to make the BAM workers happy in some way. I am not saying that there was no getting rid of national ensembles, poets, singers and composers. They considered it an honor to go to BAM.

Complaints that the masters of culture had forgotten about BAM began to be heard especially frequently. Aleksey Fedorov, chief of the Komsomol Central Committee staff on AYAM, laments:

"The lads often ask me, egging me on: Do our creative collectives in general know about such a construction project as AYAM? Indeed, you do not meet them

frequently on the right-of-way. It is difficult to maintain enthusiasm among the youth when their work is not noted in the required way."

Later, in Moscow, I called A. Ponko, chief of the RSFSR Ministry of Culture's Main Organizational Inspectorate Administration. I relayed to him the complaints of the BAM workers.

Aleksey Dmitriyevich replied: "That cannot be. We have a whole interdepartmental commission operating for the cultural support of BAM workers. Yes, and we have also not forgotten about AYAM; It is sufficient to say that a plan has been compiled for cultural sponsorship measures.

I. A. Ponko listed a complete constellation of names of cultural and artistic figures who had visited BAM. Hundreds of concerts, tens of thousands of "people embraced".... Alas, the majority of them were on tours in Blagoveshchensk, Yakutsk, Shimanovsk, and -- in the best case -- Tynda....

As we see, the sponsors owe a debt to the transport builders in this regard.

However, they also have quite a few complaints. The main one is with respect to the delivery of equipment. For example, the Ministry of Railways promises to send equipment for the majority of the boiler-rooms... in 1989, that is, the year of commissioning. Imagine what kind of hurrying and scurrying will begin if the situation is not immediately corrected. For example, the builders from Armenia are planning to commission the greater portion of the housing in 1988, having "connected" it to a temporary boiler-room. The sponsors from Estonia have difficulty in picturing what projects will be included in the priority complex at the station of Kichera. Uralgiprotrans has finally issued the design for the boiler-room at the station of Tungala. It is necessary that the Novosibirsk people undertake its construction more rapidly: "Time is not waiting."

Put briefly, the sponsors themselves need sponsorship. We are talking about a coordinating body which would possess actual power. Evidently, it will not be managed without the help of the USSR Gosstroy -- just as it will not be managed without party control on the spot over the activity of the sponsoring BAM subunits.

Among the numerous lessons that the transport builders on BAM have extracted for themselves, one has fundamental importance. I have in mind temporary housing for the base settlements. It has become completely worthless in 13 years. The opinion of specialists is now unanimous -- they have clearly overdone it with small stoves.

It would seem that they should have counted on main housing when they began to build the Amur-Yakutsk Main Line....

There is, for example, a settlement close to Aldan. It is "close" and not in the city itself: It is as if the builders had decided to emphasize its isolation. There is a school here -- a wooden one with laths. You will not say that it is not a good school: The classes are equipped with everything necessary -- from powerful batteries for providing warmth at 50 degrees below

zero. But here is the question: How long will this school last? The builders reply: "It will suffice for our lifetime."

I remember how many were the discussions on this subject two years ago. Everyone only said: We will work differently on AYAM -- we will build very high quality housing of a fixed capital version, and then we will work on the bridges, the filling of the roadbed, and the rails. And here is the admission of V. Brezhnev, minister of transport construction: "Again they began the construction with production. The amenities of the builders and the social, cultural and consumer services again are lagging behind."

The question involuntarily arises: Is the Ministry of Transport Construction's item for expenditures for temporary structures too great? Has a departmental approach not been placed in the estimate itself?

The responsibilities of the Ministry of Transport Construction to the railroad troops have turned out to be completely forgotten. For example, they have completely stopped shipping containerized houses -- light and easy to transport -- to the eastern section. This has led to approximately 200 families of servicemen, workers and employees of the Soviet Army living in railroad cars today.

They have begun to practice the watch method on AYAM widely. However, they have distorted its essence from the very beginning. Where some watch workers must live, they have placed small stoves. Families have taken up residence in them, and conditions for normal living have not been created.

The psychology of temporary workers is thus instilled. Meanwhile, the development of the AYAM zone requires people who are permanent. The attachment of cadre is a task for the Ministry of Transport Construction that is no less important than the construction of the main lines itself. You see, the arrival and maintenance of one person in the zone of BAM and AYAM costs the state 20,000 rubles. One cannot allow experienced and skillful personnel to go home -- to the country's western rayons -- after the completion of the construction project.

Party documents have repeatedly pointed out that Siberia primarily needs a very rapid development of social and living conditions. The disregarding of these propositions has already turned into unfilled losses for the builders of BAM and AYAM. One cannot allow their severe costs to continue growing.

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## RAIL SYSTEMS

### OFFICIAL RESPONSE TO VARNA-ILICHEVSK RAIL FERRY ISSUES

Moscow GUDOK in Russian 15 Feb 87 p 1

[Article by V. Butko, deputy minister of railways: "Changes Are Needed -- and as Soon as Possible"; first paragraph is GUDOK introduction]

[Text] A response to the report that was published in GUDOK on 11 February concerning the operation of the Varna-Ilichevsk international railroad ferry crossing "Results and Prospects."

The Main Administration for Railway Traffic has carefully familiarized itself with the article from the TASS Sofia department. It correctly raised the problems that have arisen in the operation of the Varna-Ilichevsk crossing. They do not exist only on the Bulgarian side of this complex. They are encountering similar difficulties in Ilichevsk also.

In general, quite a few successes, about which sufficient has been written and said, have been achieved here. In particular, shipping volume is growing and the turnover of the ferries is being reduced.

However, the statistical loading of railroad cars has been reduced when transporting ferrous metallurgy and chemical industry products, soda (in soda carriers), machinery, equipment, preserved food (in covered railcars), and several other cargoes. In our opinion, the primary reason for the poor utilization of the rolling stock is the fact that Soviet foreign trade organizations are issuing small orders to the Bulgarian suppliers, which do not correspond to the carrying capacity and volume of the rail cars. Even for bulky freight, the orders are unjustifiably split up by delivery periods and product types. On the other hand, the railroad workers are not sufficiently demanding upon the consigners and do not work with them enough to increase the utilization of the railcars.

These and the other shortcomings, which have arisen on our side, of course, reduce the efficiency of the crossing. For example, how is it possible to reconcile oneself with the fact that a number of enterprises (the Minsk Motor Vehicle Works, Volga Cement Plant, Taganrog Metallurgical Plant, Magnitogorsk Metallurgical Combine, the Voronezh Plant imeni Komintern, and Tselinogradselmash [Tselinograd Agricultural Machine Building]) are not



delivering their products to us smoothly for shipment on the international railroad ferry crossing? The difference in the nature of the counter flow of the freight also hinders the work. Basically, goods are dispatched from the USSR to the People's Republic of Bulgaria in gondola cars, and freight in closed railcars predominates in that from Bulgaria. This is one of the main reasons that the percentage of empty railcars in 1986 reached 11.5 percent. It is very difficult to decrease significantly the percentage of empty shipments.

They can ask me what is happening: The journalists posed questions which the Soviet and Bulgarian transport workers should resolve, but now, do you see that one of the directors of the Ministry of Railways himself is putting out question marks? Yes, unfortunately that is so. Here, I do not think that the last word should belong to science which could prompt what should be carried how and by what, considering the development and strengthening of trade and economic relations between the two fraternal countries.

I agree with the TASS correspondent that there are enough bottlenecks in the international complex -- both on the Soviet and on the Bulgarian sides. In my opinion, there is another Achilles' heel -- it is the lack of timely information about what and how much will be loaded on the next ferry that is dispatched from Varna or Ilichevsk. This creates additional difficulties for us and for our friends. USSR and People's Republic of Bulgaria specialists are still delaying the introduction of the Parom automated control system. This, in particular, is having a negative effect on the timeliness of the information about the approach of cargo to the ports. An electronic computer would reduce labor-intensiveness in processing the shipping documents. There is still not even a common accounting form and unified documentation that accompanies the cargo. This, of course, also increases the demurrage time of railcars. To our great shame, there are so many of these "accompaniments" that some bibliophile, having turned them in at the appropriate reception point, would certainly not experience a "book famine" for many years. The TASS correspondent who mentioned this in his article, was right a thousand times over!

I would like to say a few words about the organization of international socialist competition between the crews of USSR and People's Republic of Bulgaria vessels. It is possible that it will seem to someone that I am "interfering" in someone else's affairs. However, for us, the railroad workers, the affairs of those, who service the entire complex along with us, cannot be foreign. Thus, the cooperation between Soviet and Bulgarian crews at times has a formal and episodic nature. The mutual exchange of experience has been organized poorly. The required persistence in solving the most urgent questions does not exist -- for example, ones like accelerating the passage of vessels through the rather narrow canals on the approaches to Varna.

The seamen must be more energetic in requiring the building of modern navigation systems so that the ferries can freely pass through the two sections of the canals. We think that our allies have reserves to speed up the movement of vessels on the entire route from Varna to Ilichevsk and back.

All of the opportunities for the very rapid handling of ferries are not being used in Illichevsk and Varna.

Where is the way out from the situation that has been created? I ask myself this question on the eve of a meeting in Sophia where the scheduled 18th Session of the Council of Directors of the Ferry Complex is being held at the level of transport and foreign trade department directors of the two countries. I think that it will, first of all, be necessary during it to admit that this council is still not fully influencing final work results and is not solving the entire complex of questions. Changes in the management structure cannot be put off; they must be begun. One of the possible paths for changes is the establishment of a joint Soviet-Bulgarian enterprise for operating the international railroad ferry crossing. The possibility of organizing such an enterprise will be carefully examined with our Bulgarian comrades during the coming session of the Council of Directors.

Now, when the restructuring of foreign economic relations is being unfolded and the functions of departments and their subunits are being examined, those links, which are at the junction of many branches, should not escape this process. Otherwise, this can turn into interruptions in the rhythm of their work and a shortage of products. That is why it is necessary to reorganize the mutual relations of transport, industrial and foreign trade organizations as rapidly and resolutely as possible. We are talking about the use of new and progressive forms of cooperation.

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CSO: 1829/163

## ER200 HIGH-SPEED ELECTRIC TRAIN OPERATIONAL EXPERIENCE

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 1, Jan 87 pp 38-43

[Article by L. V. Gutkin, candidate of technical sciences, under the rubric "Scientific and Technical Progress in Transport"; "The ER200: Experience, Efficiency, Problems"; first paragraph is ZHELEZNODOROZHNIY TRANSPORT introduction]

[Text] The ER200 high-speed electric train has been in continuous operation on the Moscow-Leningrad line since March 1984. During that time not a single one of its trips has been cancelled and it has transported approximately 120,000 passengers. Regardless of the season, there are no empty seats on the train. Along with business-like critical wishes to improve service, there are numerous positive comments from passengers about the convenience and comfort of trips at movement speeds of up to 200 kilometers per hour.

When it became clear at the end of 1983 that one could not expect the quick manufacturing of a batch of ER200-type electric locomotives, the Ministry of Railways decided as an experiment to begin permanent high-speed operation of the only ER200 electric train which had been built at the time, along with other passenger, suburban and freight trains on the Moscow-Leningrad line. This decision required the accelerated and additional preparation of all facilities on the line and the electric train itself, the development and issuance of appropriate directions and instructions, and the relaying of them to the ones who would carry them out. Operating with a great strain on their strength and with enthusiasm, the workers in the Locomotives Main Administration and the October Mainline completed the preparatory work practically in two months with the participation of other Ministry of Railways main administrations, the All-Union Scientific Research Institute of Railroad Transport, the Riga Railcar Construction Plant, and the Riga Electric Machine Construction Plant.

A maximum speed of 200 kilometers per hour was established on sections of the line, which were equipped with the ALS-200 automatic locomotive signaling multiciphered system. On sections where the track had been prepared for a movement speed of 180-200 but where the ALS-200 had still not been placed, a speed of 180 kilometers per hour was established for the electric train. Differentiated norms for limiting the speed, which allowed the ER-200 electric to travel at speeds 20-30 kilometers per hour faster than passenger trains

with ChS2T, ChS6 and ChS200 electric locomotives, were adopted in places where restrictions existed on straight sections of track. This was connected with the more favorable dynamic qualities of the crew compartment of the train.

A 14-car ER200 electric train was made ready for operation and reequipped for high-quality passenger service, consisting of two leading non-motorized coaches and 12 motor coaches of two types: MT (with a current collector) and M (without a current collector). In this respect, the MT and M motor coaches operate in pairs with each other, forming a single eight-motor system. For regular passenger trips, the electric train is formed from 10 coaches in accordance with the schema G [leading]+ 4 (MT+M)+G. The remaining four motor coaches are in reserve and are used when necessary to replace individual coaches that have been uncoupled for planned or nonplanned repairs. The leading coaches are not in reserve; they are repaired during the time that the electric train stands idle between trips.

Passenger trips are made twice a week: on Thursdays, the train travels from Leningrad and on Fridays -- from Moscow.

There are work positions for the train commander and radiotelephone operator and places for the replacement locomotive brigade, bar and buffet personnel and the train technical maintenance brigade in the leading coaches that are equipped with a cab for the engineer. In addition, plant, institute, and various road management service specialists, who regularly observe the condition of the electric train and the maintenance of the track, electrical supply systems and communications systems when they periodically accompany the train, are accommodated in these coaches.

The continuous improvement in the system for its technical maintenance has contributed to the steady and regular operation of the ER200. The train has been added to the Leningrad-Passenger-Moscow Locomotive Depot. The latter has available a workshop for ER200 maintenance with two repair pits. The equipment in the shop permits TO-3 [third echelon technical maintenance], TR-1 [first echelon routine maintenance], TR-2 [second echelon routine maintenance] and individual types of modernization work to be carried out by lifting the body on jacks without rolling out the traction engines. The traction engines are rolled out in the shop for hoisted repairs. For the TO-3 technical inspection, they uncouple the electric train each time into two sections with shunting.

Upon arrival in Moscow, the TO-2 technical inspection is carried out using the forces of the service brigade that travels with the electric train from Leningrad. This procedure must be considered a temporary one -- only one train is in operation as yet and its technical servicing in Moscow requires the appropriate training of workers. The composition of the service brigade consists of a senior foreman, an engineer-product engineer and metal workers who have the qualifications of a mechanic, automated mechanism repairman, electrical machinery repairman and an electronics repairman. The train is not uncoupled into two parts in Moscow because of the load on the territory of the locomotive depot and its shops. That is why during the placing of the 10-coach electric train having a length of 266 meters in the routine

inspection shop, it is necessary to leave the gates on both ends of the building open and to move the train along the pits in order to inspect all coaches. This cannot be put up with during the winter and that is why the electric train operates with eight coaches for three-four months of the year. Even in this case, however, the gates at one end of the building must be kept open since the length of the train is calculated for the placement of a 10-car suburban electric train which is 12 meters shorter. There also exists other unsolved problems in the technical maintenance of the ER200 electric train in Moscow.

TO-2 and TO-3 technical inspections are carried out weekly; TR-1 repairs -- once a month; and TR-2--once a year. Large-scale non-planned repairs to equipment are performed in Leningrad, by delivering -- when necessary -- individual broken-down cars from Moscow usually as part of the electric train itself and -- in exceptional cases -- with a reserve locomotive. This same electric locomotive delivers a substitute ER200 car in good working order to Moscow. The maintenance in Moscow of reserve coaches of the two types (MT and M) for the rare cases of replacing operating broken-down coaches, which was practiced when operations began, is less convenient and we have given this up.

During the entire period of operations, there has never arisen an emergency situation with the crew part which would preclude the possibility of transporting broken-down motor coaches from Moscow to Leningrad. There has also never been any damage to the leading coaches that would require the cancellation of a trip because of the lack of reserve coaches of this type. However, the possibility of such a situation has not been eliminated. That is why the question of the need for manufacturing an additional two leading coaches was posed to the Ministry of Heavy and Transport Machine Building and the Ministry of the Electrical Equipment Industry even before the ER200 electric train was put into permanent operation. Nevertheless, this question still remains practically unsolved.

The total kilometers, which have been logged by the individual motor coaches since their construction, has reached 230,000 kilometers; and that of the leading coaches -- 370,000 kilometers. During this time, no damage in the bogie frames and the body has been detected. However, the kilometers logged are still insufficient for a valid conclusion on the actual fatigue strength of the more critical equipment assemblies. That is why regular observation of these assemblies is continuing in accordance with the program of operating tests for the ER200 electric train. The coaches of the electric train were built 10 years ago and complex technical tests have been conducted on them. As a result of these, the accelerated ageing equipment components, in particular, the electrical insulation, was able to set in. That is why a decision was made to carry out factory repairs on the motor coaches during 1986 in the Oktyabrsk Railcar Repair Plant by sending them in turn to the plant without interrupting the operation of the electric train in order to detect hidden defects. This work is being done.

The traction properties of the electric train permitted a scheduled time for the trip between Moscow and Leningrad to be set during the first period of

its operation at 4 hours and 59 minutes, including a 10-minute technical stop in the middle of the route at the station of Bologoye. Beginning with the third trip of the electric train, the intermediate stop was done away with because of the fact that, as operating experience showed, there was no need to perform a planned inspection of the undercarriage and current collector after a run of 320 kilometers. At the same time, the need to use the freed 10-12 minutes to compensate for non-scheduled speed limitations based on the condition of individual sections of the track and for delays of the train because of technical malfunctions that arose in the signaling and safety interlock system, etc., was revealed.

All of the services, which insured the passage of the train on schedule, had acquired the necessary experience by the end of the third quarter of 1984. The number of speed restrictions for track conditions was reduced, the power supply system was partially strengthened (in a number of zones, the over current protection settings were raised and the carrier cable was replaced), and a partial modernization of the electrical equipment in the electric train's coaches, which protected it from snow, was carried out. As a result, an opportunity appeared to adjust the train's movement schedule by decreasing travel time 20 minutes. In September 1984, the schedule time was set at 4 hours and 39 minutes.

The large length of section with an actual speed of 160 and 180 kilometers per hour and of up to 200 kilometers per hour on individual sections (Table 1 and Figure 1) insures a high average speed level -- 140 kilometers per hour -- on the Moscow-Leningrad route. The electric train covers the high-speed Tosno-Bologoye section with the highest average speed. Here, it travels at a speed of 200 kilometers per hour on individual sections and at 180 kilometers per hour for a stretch of 74 kilometers. The electric train covers the Bologoye-Klin section with an average speed of 148 kilometers per hour, reaching 180 kilometers per hour on sections with a total length of 80 kilometers. Because of different speed restrictions, including up to 60 kilometers per hour, braking takes place on the high-speed Tosno-Bologoye-Klin section on the average every 15.5 kilometers; and in the suburban zones of Leningrad (Tosno and Klin) and Moscow -- every 9-10 kilometers. The electric train passes through the suburban zones with an average speed of 100-120 kilometers per hour. As a rule, the electric train is allowed to travel over sections and through stations along the entire route only when the traffic lights are green.

Through the joint use of electric rheostat disk brakes and electro-pneumatic disk brakes controlled by a dependable anti-skid device, the engineers increased the reserve of time during the first period of operating the train so as to compensate for delays caused by temporary speed restrictions and individual interruptions in the traffic light's displays. However, the service life of the brake disks on the motor coaches was reduced because of the repeated use of the electropneumatic brakes. Since the number of delays of the electric train on its trips was reduced by the end of 1984 and the operation of the electrical equipment in the motor coaches was improved at the same time, the carrying out of the scheduled travel time was possible with the use of only the rheostat brake on the motor coaches during all braking adjustments.



Section	Length, KM	Average speed, KMPH	Maximum speed, KM PH	Number of brake applications on the trip (6 Feb 86)
Leningrad - Tosno	53	122	160	6
Tosno-Bologoye	267	150	200	18
Bologoye -Klin	241	148	180	15
Klin-Moscow	89	110	180	9
Leningrad-Moscow	650	140	200	48

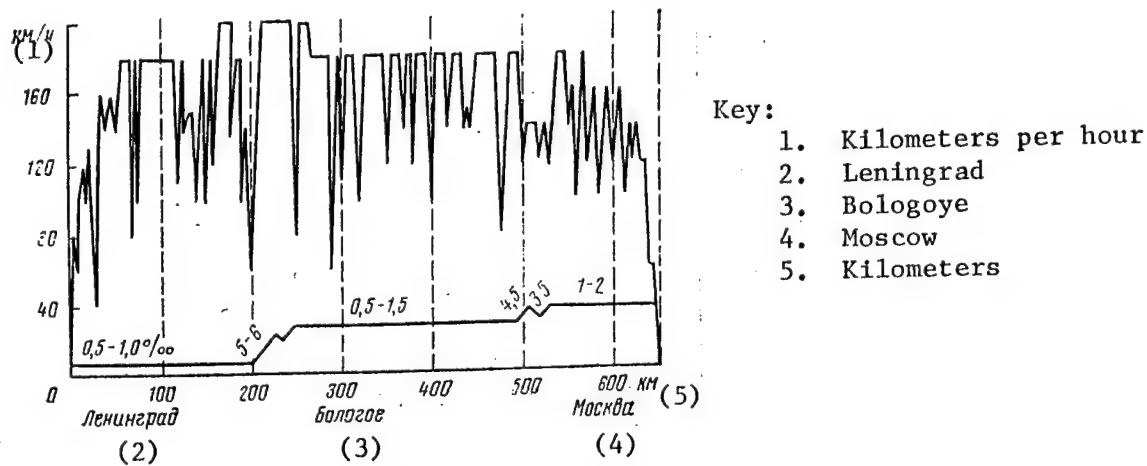


Figure 1

Because of their construction, the brake disks of the leading coaches are more durable and the application of the electromechanical brake on these coaches is not restricted.

Based on the results of traction and power tests, a traction and brake current setting of 400-420 amperes was selected. Operations showed that the current setting should be lowered to 300 amperes in order to increase the reliability of the thyristor impulse regulator at air temperatures of +20° Centigrade and higher. A setting of 400 amperes is allowed only when accelerating from 140 to 200 kilometers per hour. The loss of travel time during this is insignificant. It is evident from Figure 2, where an analysis of the traction calculations for a 10-coach ER200 electric train is presented, that decreasing the setting from 400 to 300 amperes increases travel time on the Leningrad-Moscow route by only 2.5 minutes, and the effective warming current of the traction engines is decreased by only 20 percent (points zero).

Since the possibility of the de-energization of individual motor coaches during a trip still exists, calculations have been performed on various de-energizations of from one to five coaches in a 10-coach electric train consist. When a portion of the traction engines has been de-energized, the effective warming current of the engines, which remain operating, increases and the

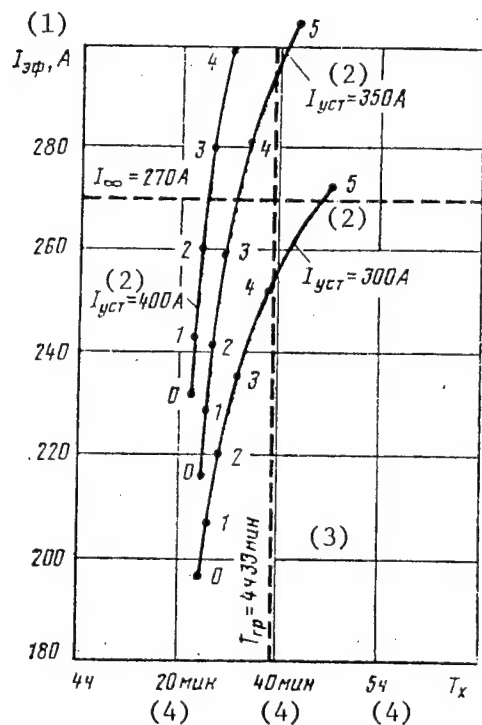


Figure 2

Key:

1.  $I_{эф}$  A
2.  $I_{уст}$
3.  $T_{уст} = 4439$  minutes
4. Minutes
5. Hours

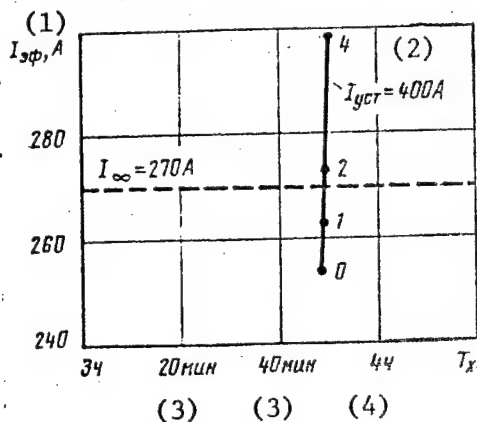
travel time grows. For example, when the setting is equal to 300 amperes and all motor coaches are operating (Cf. Fig 2, 0 on the  $I_{уст} = 300$  amperes), the effective current is 180 amperes (0.67 of the long-term current) and the travel time is 4 hours and 25 minutes. If three motor coaches are de-energized (the number of the drive axles is 50 percent), the effective current of the operating traction engines is increased to 235 amperes (0.88 of the long-term current) and the travel time increases to 4 hours and 32 minutes (.3 on the  $I_{уст} = 300$  amperes curve). When three motor coaches are de-energized, the travel time reserve is reduced from 14 to 7 minutes and this does not permit the schedule to be fulfilled in this case.

With a 400 ampere setting and three de-energized motor coaches, travel time is 4 hours and 27 minutes (Cf. Fig. 2, 3 on the  $I_{уст} = 400$  ampere curve) and the reserve of time is equal to 12 minutes. This is acceptable for the travel time, but the effective current increases to the limiting value of 280 amperes (1.04 of the long-term current) for the heating of the traction engines. This is inadmissible even during winter. That is why based on operating experience and on the basis of traction calculations carried out, engineers were given a recommendation not to use the 400 ampere setting if three motor coaches were de-energized on a 10-coach train. In this case, it is necessary to work with a setting of 300 amperes. With four de-energized motor coaches, the number of drive axles decreases to 40 percent and that is why it is necessary not only to reduce the setting for the traction engine current to 300 amperes but also to rule out accelerations to speeds higher than 160 kilometers per hour.

The situation is complicated during winter by the fact that the electric train, as was pointed out, operates in an eight-coach configuration and the percentage of the drive axles is reduced accordingly. Calculations show that it is inadmissible to use a setting of 400 amperes under these conditions even when two motor coaches are de-energized (the number of drive axles is 50 percent). When three motor coaches have been de-energized (the number of drive axles is 37.5 percent) it is necessary to limit the maximum speed to 160 kilometers per hour in addition.

Operations have shown that with a setting of 300 amperes and the absence of electrical equipment failures (all motor coaches are operating in the traction mode), existing non-scheduled speed restrictions due to the condition of the track are -- practically speaking -- compensated for by the reserve of travel time if additional delays do not arise because of interruptions in the track traffic signal displays and the ALS-200 due to the fault of workers in the movement service, etc. It has also been established that a train is three-five minutes late because of electrical equipment failures, and 5-15 minutes late due to reasons that do not depend on its technical condition. When these two types of delays coincide, the delay reaches 8-20 minutes. In those rare cases where a halt is required during a trip in order to find out the cause of a fault and to perform work to insure the further safe travel of the train, the delay has been on the order of 20-30 minutes. Only two cases of prolonged delays have been noted during the entire operating period -- four hours because of ice on the wires of the catenary system and current collectors in April 1984, and three hours because of a break in the catenary system in October 1985. The majority of the electric train trips have been performed without a delay.

By 1990, it is planned to reduce the number of permanent speed restrictions on sections and at stations based on the condition of the track and significantly increase the length of sections with a prescribed speed of 200 kilometers per hour. In doing this, the scheduled travel time for a 14-car ER200 electric train can be reduced to approximately four hours (an average speed of 160 kilometers per hour for the route) according to traction calculations. In this case, one motor coach in a 14-car consist can be de-energized and preserve a reserve of travel time on the order of 11-12 minutes under the conditions of the traction engine heating up at a setting of 400 amperes (Figure 3).



Key:

1.  $I_{эф}, A$
2.  $I_{уст} = 400 A$
3. Minutes
4. Hours

Figure 3

It has been established during the two years of operating the ER200 electric train that the specific electrical power consumption for traction and its own needs (except for heating) changes depending on the number of motor coaches in the consist. When the number of cars is increased from 8 to 10, the specific consumption in kilowatt-hours for 10<sup>4</sup> ton-kilometers is reduced by 3.5 percent; and the specific expenditure in watt-hours per passenger-kilometer -- by seven percent (Table 2).

Table 2

Number of cars in a Consist	Electrical Energy Expenditure at a Speed of 140 kmph (1985-1986)					
	Leningrad - Moscow			Moscow - Leningrad		
	1000's	KWH	KWH	1000's	KWH	KWH
	KWH	10 <sup>4</sup> T-KM	Passenger KM	KWH	10 <sup>4</sup> T-KM	Passenger KM
8	12.3	390	45.5	11.8	374	43.6
10	15.0	377	42.4	14.4	360	40.7

Despite the generally equal nature of the lines, climbs predominate from Leningrad to Moscow and descents in the opposite direction. There exists a section with grades of five-six percent where the electric train travels in the direction of Moscow with the traction engines constantly switched on; and in the direction of Leningrad -- coasting. That is why the expenditure of electrical energy is four percent greater when travelling from Leningrad to Moscow than in the opposite direction.

It is necessary to point out that the specific power consumption of the ER200 electric train in watt-hours per passenger-kilometer is 25-fold less than for TU-134 airplanes operating on Aeroflot's Moscow-Leningrad route. In this respect, a 14-car ER200 electric train based on its number of seats can transport as many passengers in one trip a day as the TU-134 airplanes do in 11 trips a day (according to Aeroflot's 1986 schedule). The travel time from the center of Moscow to the center of Leningrad on both types of transport is identical (Table 3).

Thus, the two years of experience in operating the train have confirmed the advisability of the decision that was made to organize high-speed passenger service with a limited pool of electric trains working together with other types of transport with gradual improvement in the design of the new rolling stock; the track; and the power supply, signaling and safety interlock systems and with an improvement in the way movement is organized.

When making the decision about introducing the first ER200 electric train into permanent operation, the Ministry of Railways and the Ministry of Heavy and Transport Machine Building made provisions for beginning the delivery of a batch of type ER200 electric trains to the October Railroad in the shortest possible time. The introduction of a batch of ER200 electric trains

Table 3

Components of Time Expenditures	Travel time from the center of Moscow to the center of Leningrad	
	TU-134	ER200
City transport in Moscow to get to the airport	1 hour	---
Check in and boarding	1 hour	10 minutes
Travel from Moscow to Leningrad	1 hour and 40 minutes (considering the warming of the engines and taxiing)	4 hours and 40 minutes
Getting baggage and getting to city transport	40 minutes	10 minutes
City transport to Leningrad from airport	40 minutes	-----
Total	5 hours	5 hours

would permit the main passenger shipments to be carried out on the Moscow-Leningrad mainline with maximum convenience for passengers and would considerably lessen the load on air transport on this avenue. This is of no small importance from the point of view of saving liquid fuel. The organizing of the daily circulation of only one pair of ER200 trains by delivering a second ER200 electric train and the required amount of additional leading and motor coaches to the railroad would pay for itself in 2.4 years.

The All-Union Scientific Research Institute of Railroad Transport and the main administrations of the Ministry of Railways jointly prepared and transmitted to RVZ [Riga Railcar Construction] and REZ [Riga Electrical Machinery Construction] plants technical requirements for an improved model of the ER200 electric train which consider the results of all tests. However, an acceleration in this matter did not occur. The plants were not ready to develop the corrected production forms and records and were incapable of submitting a program for the appropriate work to the State Committee for Science and Technology and the USSR State Planning Committee. Disagreements arose between RVZ and REZ concerning the time frames for producing electric trains with the long-range parameters. All of this has led to the fact that RVZ did not resume production of the ER200 electric trains, which were so needed by transport, during the 11th Five-Year Plan.

When evaluating the present state of this important question in general, one must admit that the Ministry of Heavy and Transport Machine Building, to which RVZ is subordinate, and the Ministry of the Electrical Equipment Industry under which REZ is located, had still not reorganized in the spirit of today's

requirements. The plants have not adopted many of the suggestions, which have been prompted by the operating experience for improving the design of the second ER200 electric train. They have stretched out the coordination of the technical requirements for it for two years in developing the documents. As a result, the plants are planning to manufacture a second electric train only during the fourth quarter of 1988, conduct acceptance tests in 1989, and begin production of the adjusted series only in 1990.

Let us now look at the problem somewhat differently -- from the perspective of the future. There already exists a sample electric train with a speed of 200 kilometers per hour. It is being successfully operated and can be produced serially with a certain amount of additional work. This work was in the program for the last two five-year plans. At the time, a speed of 200 kilometers per hour was justified. Today's achievements of transport equipment permit one to seriously talk about a second generation of high-speed electric trains that would be designed for a maximum speed of 250 kilometers per hour (Japan) and 280 kilometers per hour (France).

The party has posed the task of carrying out a thorough technical restructuring of the national economy based on the most modern achievements of science and technology. In conformity with this problem, this means the shift to designing and building high-speed electric trains with a specific power of no less than 16 kilowatt/tons (20 percent more than the ER200) and with a maximum speed of 250 kilometers per hour. Such a train would insure non-stop communications between Moscow and Leningrad in three hours.

It is also necessary to begin developing two-system (using two types of current) rolling stock on the basis of the second generation electric trains for specialized high-speed mainlines of great length with permissible speeds of 250-300 kilometers per hour. Here, we primarily have in mind the building of a special Moscow-South Mainline which has particularly important social significance.

Generally speaking, the problem of increasing the speed of passenger trains is one of the most important problems in accelerating scientific and technical progress on rail transport.

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## RAIL SYSTEMS

### MEASURES PLANNED TO COMBAT INCOMPLETE RAILCAR UNLOADING

Moscow GUDOK in Russian 20 Feb 87 p 2

[Interview with Nikolay Mikhaylovich Gavryushin, deputy chief of the Container Transport and Commercial Work Main Administration, by R. Ksirov, GUDOK correspondent: "So That the National Good Will Not Perish"; date and place of interview not given; first three paragraphs are GUDOK introduction]

[Text] During recent years, the turnover of rolling stock -- and this means the shipment of national economic freight also -- has slowed down significantly because of the poor organization in unloading railcars. They are sent dirty and with the remnants of freight in them to be adjusted for coal, liquid fuel and other important national economic products.

The fact that the customers send empty railcars with unloaded materials is an old illness. It is necessary, however, to cure it -- and the faster the better.

Our correspondent met with N. Gavryushin, the deputy chief of the Container Shipment and Commercial Work Main Administration and asked him to give his estimate of the situation that had taken shape.

[Question] Nikolay Mikhaylovich, the picture is clear to everyone, but everyone does not know what the consequences are of such a situation with residues. Let us begin the discussion with this.

[Answer] Frequently the receiving enterprise leaves anywhere from 500 kilograms to 15 tons and even more in each railcar. As a result, approximately a million tons of freight is discarded in dumps! Generally speaking, the railroad spends up to 25 million rubles annually in cleaning dirty railcars. A total of 227,000 railcars were removed this winter from shipping assets because they were not cleaned. It would have been possible to ship more than 14 million tons of products in them.

In order to picture what the residues mean for the national economy, I will cite only one figure: Only 25-30 percent of the total time is spent unloading railcars using mechanical means -- railcar picks, clamshells, by gravity on raised tracks and tressels, etc. We spend the remaining time unloading the national wealth remaining in the railcars.

[Question] Why is it that residues in empty railcars have become a chronic phenomenon? Is this really explained only by the negligence and lack of discipline by the recipient?

[Answer] Of course, clients, who do not fulfill their obligations, are primarily guilty. You see, there exists Article 51 of the USSR Railroad Regulations in which it is said that the recipient must completely unload a railcar and turn it over to the railroad workers clean and without any residues.

However, many are violating this procedure, even despite the fact that the strictest measures -- up to and including the bringing of a criminal suit -- are being taken against them. Why? The workers have no material incentives. The output and time norms and the earnings calculation, which is done, are now stipulated, generally speaking, only for the unloading operation, that is, the cleaning is almost not provided for in these norms. It is allegedly included in the unloading operation and represents only 0.2-0.6 percent of the overall norm. Speaking crudely, the worker is not interested in cleaning a railcar because he receives almost nothing for this .... That is why it is necessary to introduce separate output and time norms for the unloading operation and for railcar cleaning, at the same time increasing the rate for cleaning railcars considering the actual labor expenditure. In our opinion, this will improve the matter.

[Question] An opinion, of course, is a good thing but will it not remain within the walls of the ministry?

[Answer] I think that it will not: We are planning to submit this suggestion to the USSR Council of Ministers. We have already prepared such a document, and it will go for the minister's signature.

[Question] It seems that you are beginning to talk about what the Ministry of Railways is undertaking in order to eliminate residues in railcars .... In this case, I ask you to add: What are the more specific measures being undertaken by the ministry?

[Answer] Let us say right out that there are quite a few of them -- especially in January and February. It is known that freight remains in railcars primarily in the enterprises of ferrous and nonferrous metallurgy, the agro-industrial complex, the Ministry of the Construction Materials Industry, Ministry of Construction, the Chemical industry, Ministry for Mineral Fertilizer Production, Ministry of Power and Electrification, and the State Committee for the Supply of Petroleum Products. That is why, we have turned as the first matter of business to a number of ministries so that they themselves will take steps on the spot. In particular, Comrade Kolpakov, the USSR minister of ferrous metallurgy, was informed on 16 January that the Orsko-Khalilovskiy Metallurgical Combine handed over almost 2,500 uncleaned railcars to the railroad workers last year; and the Novolipetskiy Metallurgical Combine -- more than 28,000 of these cars. The situation has not changed: Even today, they are handing over empty railcars with freight residues -- 1.5-2 tons in each one. The Zhdanovskiy and Magnitogorskiy Metallurgical

Plants, Yuzhno-Uralskiy Nickel Combine, Chelyabinskiy and Cherepovetskiy Metallurgical Plants, Azovstal Metallurgical Combine, and others are doing the same thing.

These appeals were also sent to Comrade Mayorets, USSR minister of power and electrification, and to Comrade Olshanskiy, minister for mineral fertilizer production. The trouble is that the Zmiyevskaya and Ladyzhinskaya GRES [State Regional Electric Power Station] and the Kurganskaya, Chelyabinskaya and Zaporozhskaya TETs [Heat and Electric Power Station] quite frequently leave residual fuel oil in tank cars. The Voskresenskoye Minudobreniya [Ministry for Mineral Fertilizer Production] Production Association; Balakovskiy Chemical Plant; Krasnodarskiy, Konstantinovskiy and Dorogobuzhskiy plants; and other related enterprises are not using vibrating equipment to clean the railcars-- yes, and they are not cleaning them by hand. As a result, apatite carriers, mineral carriers and cement carriers are piling up at the stations of Apatity and Kirovsk-Murmanskiy....

[Question] However, is it really impossible, generally speaking, to establish on a state-wide scale some kind of requirements for quality in cleaning railcars?

[Answer] It is possible and it is necessary. The need for introducing a state standard, especially under the conditions of state acceptance, has come to a head. For example, the Ministry of Railways has already submitted a draft standard to the USSR State Committee for Standards, which is called "General Requirements for Quality in Cleaning Railcars After Unloading and During Their Preparation for Loading With Freight." It was not approved, however, because the ministries and departments did not have a single opinion on this score. In January, we again sent our draft standard to the USSR State Committee for Standards and will insist on its adoption. The absence of criteria for evaluating the cleanliness of railcars and the broad interpretation of the requirements in shipping rules and regulations leads to many recipients not taking steps to mechanize the cleaning of railcars after they are unloaded. The failure to clean them eliminates approximately 10,000 railcars every day from shipping assets. If a state standard for cleaning were introduced, the state would save more than 87 million rubles a year.

[Question] I would like you to tell us what is being done within the limits of our branch. You see, a great deal depends on the railroad workers.

[Answer] Yes, the railroad workers on the spot must make stricter demands on the consignees and make fuller use of the right that has been granted by the Railroad Regulations: to monitor and not accept dirty railcars after unloading.

The minister recently sent a telegram to the railroads. Strict monitoring of its fulfillment has been established. The essence of the instructions consists of the fact that, beginning on 20 February, the unloading station code will be written down on the waybill opposite the number of each empty railcar. This code must be transferred to the new waybill when it is

rewritten at the station where trains, which contain empty railcars, are made up. It is necessary to write the mentioned code on form DU-1 waybills in the "Comments" column; and on form DU-1P waybills -- in the "Notes" column. Locomotive engineers must now check for the presence of the dispatching station's stamp on the waybill and the completeness of the entries for all railcar numbers on it before the departure of the train with empty railcars and during the coupling of empties to it along the route. If it is found that there is no code on the waybill, the departure of the train is forbidden. The accurate indication of the unloading station's code and its accurate transfer to the new waybill is placed on the worker, who has compiled it, and on the chief of the station, at which the waybill is compiled, changed or rewritten.

In a word, the innovation of entering the unloading station's code on a waybill will permit the specific guilty party to be found more rapidly, that is, the one who dispatched the empty railcar with freight remaining in it.

Moreover, the minister has ordered all railroad and division chiefs to organize operational groups to monitor that the acceptance of uncleaned empty railcars is not permitted. These groups have the right to enlist the services of train make-up men, locomotive brigades, and workers in railcar facilities and other services in inspecting for the completeness with which the cars are unloaded.

[Question] It is understandable: There are not enough receiver-dispatchers. It is they who primarily must control the completeness with which railcars are cleaned.

[Answer] However, it would then be necessary to increase the receiver-dispatcher staff by at least 10-fold -- and this is unrealistic. That is why it is necessary to search for other ways to monitor the customers during unloading.

[Question] But, specifically. Let us assume that an operational group has found a railcar that has not been cleaned -- what then?

[Answer] Within a day, the members of the operational group must send the material to the procurator bodies so that proceedings can be instituted against the immediate guilty parties. An operational group will work every day.

[Question] Nikolay Mikhaylovich, in your reply to the editors concerning the article "Freight Remains in the Railcar" that was published in GUDOK, you said that recommendations for changing articles 51 and 161 in the USSR Railroad Regulations had been sent to the USSR Council of Ministers -- concerning the exaction of fines -- that is, you propose exacting penalties equal to the amount of the carrying fee from recipients who dispatch an empty railcar with residues of freight in it. There is another fine for senders who have loaded their product into a railcar which has remnants of earlier transported freight. Also, the guilty person, who has allowed freight

to remain in a railcar and permitted it to remain uncleaned, must compensate the state for the damage caused. Have your proposals been accepted?

[Answer] It is too early to talk about results. Our proposals are still being examined .... Incidentally, we have sent another request to the Council of Ministers. It concerns the need for serial production of equipment to restore the looseness of frozen cargo. You see, the problem of residues is now -- during the winter -- and during the transition periods -- especially the spring -- directly connected with another problem that makes our transport feverish -- the congealing of coal and other granular freight. Every day during January, 22,000-25,000 such freight cars arrived for unloading. They were unloaded practically by hand. It was necessary to enlist the services of up to 60,000 people for this work. What could the people do? Their labor productivity was 15-20-fold less than using a mechanical unloading method. There are not enough machines. That is why the Ministry of Railways addressed a request quite recently -- on 9 February -- to the USSR Council of Ministers, asking it to arrange for the serial production of such unloading devices as the Ural-TsNRI-SoZ-81M and the DP-32UKhL, drilling rippers, VI-614 vibrating-impact rippers, and assemblies for unloading clay.

[Question] The last question, Nikolay Mikhaylovich: What if this interview was held, let us say, a year from now....

[Answer] I understand what you want to ask. In my opinion, it would be quite a bit shorter since, I hope, there would be manyfold fewer enterprises handing dirty railcars over to us by that time.

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